‘Tactical Sustainable Mobility’: The Opportunities And Challenges of Using Tactical Approaches to Advance the Implementation of Sustainable Mobility Projects

Semester description: Master's Thesis - Urban Planning and Management, 4th semester

Project period: 01.06.2017 – 01.09.2017

Participant: Chloe Mullin

Supervisor: Enza Lissandrello

Page number: 73

Appendix: 12

The European Commission have set ambitious goals in terms of alternative fuels and emission reduction in urban areas (EC, 2011), which municipalities are under pressure to meet. A general acceptance of the need for increased sustainable mobility exists in political arenas and at a municipal level, however the implementation of sustainable mobility projects can often be hindered by budgetary restraints and the lack of political backing for innovative solutions.

Increasingly complex and rapidly transforming urban areas have led to planners and governmental officials being more open to alternative approaches that emphasise adaptability in order to reach city goals. This project puts forward 'tactical sustainable mobility' as a potential way to advance the implementation of sustainable mobility projects at a municipal level. The term 'tactical sustainable mobility' can be used to describe how planners are approaching sustainable mobility planning with a tactical mindset. Incorporating tactical characteristics, including low-cost temporary and scalable, to a sustainable mobility project allows for the impacts of pilot projects to be tested in a specific geographical context, and also to be used as a citizen engagement tool throughout the planning and implementation processes.

In-depth interviews were conducted with six planners across five European municipalities, Copenhagen, Skive, Aalborg, Stavanger and Amersfoort. These interviews provided insight into how municipal planners are currently planning in order to create a shift towards sustainable mobility.

To overcome the barriers to implementing sustainable mobility projects, planners are seeing the opportunities presented by taking increasingly tactical approaches. The examples of a bicycle priority road, electronic bicycle sharing scheme and biogas municipal fleet showcase the increasing focus on scalable projects, which allow innovative solutions for mobility issues to be tested in a specific urban context before the project is expanded. Despite the need for planners to adapt to shifting political, social, economic and environmental conditions that impact planning practice, there is still an issue of uncertainty when it comes to the exact role a planner should take in tactical projects and how to involve citizens in this process, in order to take advantage of the benefits that tactical sustainable mobility can provide.

Preface

The referencing format has throughout this project been the *Harvard Style*. The project is divided into numbered chapters. Figures and tables are presented in chronological order. A full reference list can be found at the end of the report, alongside a written transcription of all interviews undertaken.

‘TACTICAL SUSTAINABLE MOBILITY’: THE OPPORTUNITIES AND CHALLENGES OF USING TACTICAL APPROACHES TO ADVANCE THE IMPLEMENTATION OF SUSTAINABLE MOBILITY PROJECTS

TABLE OF CONTENTS

1 INTRODUCTION 4

2 RESEARCH QUESTION AND DESIGN 7

2.1 JUSTIFICATION OF RESEARCH TOPIC 7
2.2 RESEARCH QUESTION 7
2.3 RESEARCH DESIGN 8

3 SUSTAINABLE MOBILITY PLANNING 10

3.1 DEFINING SUSTAINABLE MOBILITY 10
3.2 SUSTAINABLE MOBILITY PARADIGM 11
3.3 EUROPEAN POLITICAL DISCOURSE ON ‘SUSTAINABLE MOBILITY’ 12
3.4 THE GAP BETWEEN THEORY, POLICY AND IMPLEMENTATION OF SUSTAINABLE MOBILITY PROJECTS 14

4 TACTICAL URBANISM 17

4.1 DEFINING TACTICAL URBANISM 17
4.2 TRENDS IN URBAN PLANNING LEADING TO RISE IN TACTICAL URBANISM 19
4.3 TACTICAL URBANISM IN PLANNING PRACTICE: A LITERATURE REVIEW 23
4.4 TACTICAL URBANISM AT THE STREET-LEVEL 27
4.5 TACTICAL URBANISM: THE PLANNER’S ROLE 29

5 ‘TACTICAL SUSTAINABLE MOBILITY’ 33

6 METHODOLOGY 37

6.1 DATA COLLECTION 37
6.2 DATA ANALYSIS 39
6.3 VALIDITY AND RELIABILITY OF RESEARCH 40

7 RESULTS & ANALYSIS 42

7.1 PROFILE OF THE FIVE SELECTED EUROPEAN MUNICIPALITIES 42
7.2 WHAT ARE THE CURRENT BARRIERS TO IMPLEMENTING SUSTAINABLE MOBILITY PROJECTS AT A EUROPEAN MUNICIPAL LEVEL? 46
7.3 HOW ARE TACTICAL URBANISM APPROACHES CURRENTLY BEING USED IN THE IMPLEMENTATION OF SUSTAINABLE MOBILITY PROJECTS? 53

8 'TACTICAL SUSTAINABLE MOBILITY': WHAT ARE THE OPPORTUNITIES AND CHALLENGES OF USING TACTICAL APPROACHES TO ADVANCE THE IMPLEMENTATION OF SUSTAINABLE MOBILITY PROJECTS? 59

9 CONCLUSION 67

10 REFERENCES 69

11 APPENDIX 74

11.1 APPENDIX 1: INTERVIEW GUIDE 74

11.2 APPENDIX 2: INTERVIEWS WITH EUROPEAN MUNICIPALITIES ON CURRENT SUSTAINABLE MOBILITY PLANNING IN A LOCAL PLANNING CONTEXT 75

11.2.1 HELENE ALBINUS SØGAARD – PROJECT ASSISTANT, MOBILITY AND URBAN SPACE 75

11.2.2 CHRISTIN BERG – PLANNER AT STAVANGER KOMMUNE 77

11.2.3 RØAR BØRRESEN: HEAD OF BICYCLE INITIATIVES AT STAVANGER MUNICIPALITY 80

11.2.4 JACKY NIEUWSTRATEN – ADVISOR FOR THE CITY OF AMERSFOORT 81

11.2.5 TERESA NIELSEN: PROJECT MANAGER IN THE ENERGY CITY DEPARTMENT AT SKIVE MUNICIPALITY 82

11.2.6 JEPPE ANDERSEN – TRANSPORT PLANNER AT AALBORG MUNICIPALITY 86

1 INTRODUCTION

One major challenge facing cities today is the environmental impact of transportation, including congestion, air and noise pollution, and traffic accidents (EC, 2007). Consequently, increased access to sustainable transportation modes in urban areas has been promoted as a solution to reduce negative environmental impacts, by regional, national and international government bodies. In the European context, the European Commission have set ambitious goals in terms of alternative fuels and emission reduction in urban areas (EC, 2011), which municipalities are under pressure to meet. Although sustainable mobility has been considered in the political arena for decades, tangible projects in the field of sustainable mobility are becoming evermore prevalent in planning practice.

In planning practice, the implementation of tangible sustainable mobility projects is now becoming more common practice at a local municipal level. There has also been a growing emphasis placed on implementing pilot projects, as a way to test the viability of potential permanent solutions in solving urban problems. However, the 'dilemma of mobility' highlights the contrast between general acknowledgment that fuel emissions need to be reduced and continued unsustainable mobility practices (Banister, 2011; Low & Connor, 2013). Therefore, despite a general acceptance of the need for increased sustainable mobility projects in political arenas and at a municipal level, the implementation of long-term sustainable mobility projects can often be hindered by budgetary restraints and lack of political backing for innovative solutions.

Increasingly complex and rapidly transforming urban areas have led to planners and governmental officials being more open to alternative approaches that emphasise flexibility in order to reach city goals (Nemeth and Langhorst, 2014). Tactical urbanism and planning ideas surrounding increasing temporary uses and scalable projects can be seen as part of the solution to cities becoming more responsive to the needs and demands of citizens (Bishop and Williams, 2012). Tactical urbanism in this context is defined as *"an approach to neighbourhood building that uses short-term, low-cost, and scalable interventions and policies to catalyze long term change"* (Lydon & Garcia, 2015, p.2). I argue that tactical urbanism approaches can be seen as a potential way to present more adaptable and flexible solutions for urban mobility in municipal planning. Thus, tactical approaches can be seen as a way for municipal planners to remove the 'red-tape' surrounding the implementation of sustainable mobility projects and accordingly aim for more permanent changes in urban areas. Ultimately providing opportunities to promote safety and connectivity for pedestrians and cyclists, and reduce the attractiveness and availability of urban space for motorised vehicles in urban mobility and public spaces planning (Barata & Fontes, 2017).

Lydon et al. (2012) have suggested that planning for a liveable city often starts at the street or block level, thus tactical projects can be seen as an effective approach to improving urban liveability. However, the scope of tactical urbanism has been noted by a number of authors (Finn, 2014; Nemeth and Langhorst, 2014) as a challenge that municipalities will have to overcome if they are to adopt some tactical approaches into planning practice. This is due to the limited and localised nature of tactical urbanism, with projects taking place on the building or street level in what Iveson (2013) calls "micro-spatial urban practices" (p. 941). Consequently presenting an issue when attempting to scale the projects to the citywide level and when using this approach to tackle urban issues within an overall strategic vision for the city.

A challenge facing municipalities today is how to engage with projects that have tactical characteristics, within the long-term planning framework (Finn, 2014). On the surface these two concepts appear to be in direct opposition of each other. The tactical urbanism approach is indeed characterised as temporary and scalable, which provides flexible, low cost solutions, whereas municipalities are often characterised by relatively inflexible planning systems. Finn (2014) notes that the planning regulations in place in some urban areas hinder the ability to create lively, walkable streets. Tactical approaches allow for a shift in the power balance during the urbanisation process, away from traditional planning practice towards citizen intervention in an impermanent way (Mould, 2014). Municipal planners are tasked with balancing short-term needs and the city's strategic long-term visions. In light of this, the approaches understood as tactical can be beneficial to municipal planners, when planning is in a post-recession era, as it allows planners to make low-cost improvements to the built environment in a time when short term perspectives become ever more important (Bishop and Williams, 2012).

It can be argued that tactical urbanism and governmental planning can in fact be mutually beneficial to one another, this is because tactical urbanism solutions can offer municipalities with opportunities to test low-cost solutions to deal with issues present in the urban context. It is suggested that this can be done by emphasising the development of local, community level creative ideas, removing the municipal level barriers in place that hinder tactical urbanism projects and placing emphasis on implementing (the physical action). (Page, 2008) In addition, the community based, participatory nature of tactical urbanism is in line with the communicative planning processes that many cities actively promote, in order to increase participation and transparency (Finn, 2014).

Prichard (2010) uses the example of cyclists in Los Angeles implementing DIY bike route infrastructure, to highlight the frustration felt by some citizens when it comes to the slow progress of government led urban development. Although tactics like these can pose safety concerns, they have also garnered praise for showing the current deficiencies in the urban infrastructure. This is an interesting issue for the policy

makers and planners, who are actively encouraging sustainable mobility in urban areas, within the discourse surrounding dense, liveable cities but are often facing political and funding restraints that hinder the implementation of larger sustainable mobility projects. Therefore, harnessing the useful aspects of tactical urbanism could allow for the impact of low-cost solutions to be tested in a local context.

This research project uses ‘tactical sustainable mobility’ as an analytical lens to understand how municipal planners are currently approaching sustainable mobility planning at a municipal level. As planners move beyond overall visions and policies on sustainable mobility and start to physically implement projects they experience a number of barriers, and tactical approaches can be seen as a way to facilitate further implementation of sustainable mobility projects in a local context. Although planners are not explicitly using the term ‘tactical’ to describe the sustainable mobility projects, this research argues that the characteristics of tactical urbanism, temporary and scalable, are being integrated into municipal sustainable mobility planning practice. The aim of this research is to assess the extent to which tactical approaches are being used in a municipal context, by discussing the current and future opportunities and challenges of implementing tactical sustainable mobility projects.

2 RESEARCH QUESTION AND DESIGN

2.1 JUSTIFICATION OF RESEARCH TOPIC

The link between tactical urbanism and sustainable mobility has been broadly researched, however not yet explicitly explored in terms of how tactical approaches have influenced the implementation of sustainable mobility projects. The link has been suggested, as projects relating to sustainable modes of transport are apparent in literature discussing tactical urbanism. Therefore the present gap in literature is explicitly looking at how tactical characteristics, of temporary and scalable, have been influencing the formal planning processes. The choice of tactical sustainable mobility as the analytical lens in this research was due to how the tactical characteristics of mobility projects discussed in the interview process as a key aspect pushing forward the implementation of sustainable mobility projects.

In addition, the research presented poses an interesting angle due to tactical urbanism being put forward as a response to the apparent failures in current planning process, therefore it is important to assess the ability for tactical urbanism solutions to help overcome these current critical issues of planning practice, in order to progress the implementation of sustainable mobility projects. Research that highlights and analyses the current frustrations and contradictions within the field of sustainable mobility planning, allow us to understand how problems have arisen and how they could potential be avoided in the future.

2.2 RESEARCH QUESTION

'Tactical Sustainable Mobility': What Are The Opportunities And Challenges Of Using Tactical Approaches To Advance The Implementation Of Sustainable Mobility Projects?

- **What are the current barriers to implementing sustainable mobility projects at a European municipal level?**
- **How are tactical urbanism approaches currently being used in the implementation of sustainable mobility projects?**

As a way to help tackle the gap between theory, policy and implementation of sustainable mobility projects, tactical sustainable mobility is used as a concept to explore in terms of the current use of tactical approaches in sustainable mobility planning to overcome the barriers discussed with the five municipalities interviewed. Tactical sustainable mobility is used by the researcher to analyse the way planners are responding to the barriers of implementing sustainable mobility projects, and is not explicitly highlighted by the planners interviewed. Therefore the main research question aims to uncover the current and future opportunities and challenges of implementing projects that can be characterised as tactical, in

the European sustainable municipal planning context. Thus, aiming to identify the extent to which tactical approaches can reduce the current gap between progressive municipal sustainability goals and the practical process of implementing sustainable mobility projects, from a planner's perspective.

The sub-questions provide a context in which the main research question can be answered, with the first sub-question providing insight into the current barriers to implementing sustainable mobility projects in planning practice by analysing the interviews with municipal planners. Based on the stories of the planners and selected planning theory relating to tactical urbanism (see section 4), the second sub-question aims to identify current tactical urbanism approaches being used in sustainable mobility planning practice at a municipal level, and identify the skills that planners learn about how tactical approaches can coexist with and be incorporated into formal planning practice.

2.3 RESEARCH DESIGN

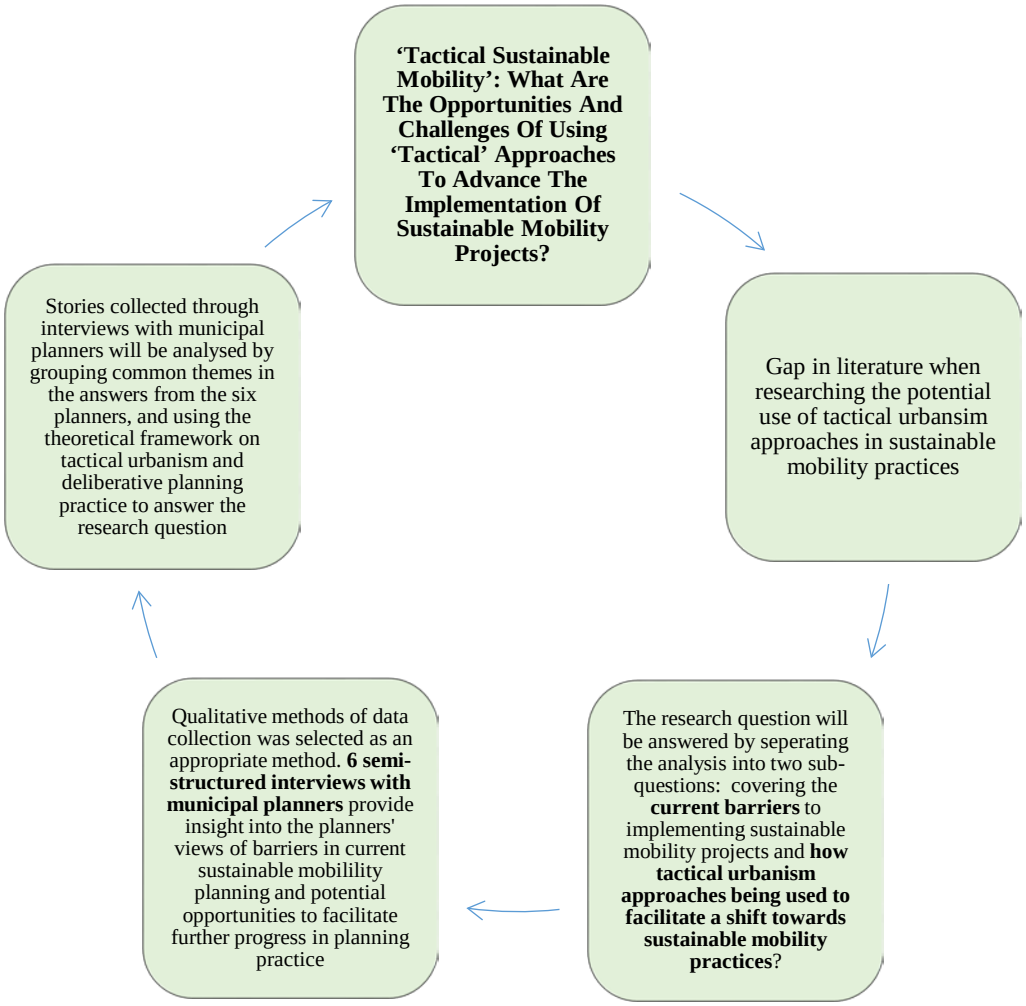


Figure 1: Research Design

Farthing's (2016) 'Research Design Cycle' was used as a basis to think about the process of selecting the research question and key questions to ask when choosing the most appropriate methods for answering the research question (shown in section 2.2). Figure 1 shows the research design for this project, demonstrating visually the cycle by which the research question will be answered through selected methods and theories.

The gap between the general acceptance of the need for increased sustainable mobility projects in political arenas and at a municipal level, and the physical implementation of sustainable mobility projects was an area of interest to explore from the beginning. This is of particular interest due to the ambitious targets the European Commission and individual National Governments have set regarding emissions reduction and transport mode shifts, and the practical implications this has at the local municipal level where strategies and physical projects are being implemented to reach these national and international targets. In the research project, the researcher uses an inductive research approach, where no theory or hypothesis drove the research project and there were very few pre-judgments before the research started, as to what the final findings would be (Farthing, 2016). Using an inductive approach allowed for freedom to alter the direction of the study once the research process had begun, starting with detailed tests of the situation and moving towards more general, subjective ideas. As shown in figure 1, the interviews were chosen as an appropriate qualitative research method and took place early on in the research to explore how municipal planners are currently attempting to implement sustainable mobility projects and what barriers they have come across in the process.

Following the interviews, general themes were extracted in relation to the current implementation process of sustainable mobility projects. From these themes, 'tactical urbanism' was chosen as a theoretical background to explore in terms of potential application in sustainable mobility planning, and became the center of the research question. Additionally, theories surrounding deliberative planning practice were chosen as further theoretical foundation for the research project. The specific practice of tactical urbanism and the potential for planners to incorporate tactical approaches into sustainable mobility planning, therefore, forms the focal point of the research question.

3 SUSTAINABLE MOBILITY PLANNING

In this research project, urban mobility has a basic definition of:

Urban Mobility "The possibility of moving in the city regardless the means of transportation of the individual" (Barata & Fontes, 2017, p.690)

A paradigm shift towards sustainable mobility planning is discussed as the ideal in many governmental documents, including EU documents and specific municipal mobility plans, as well as in transportation planning literature. However, how to facilitate the implementation of sustainable mobility solutions in urban contexts is more complicated and unclear. The following section aims to provide a review of current arguments surrounding sustainable mobility planning, with a particular focus on its place in European political discourse and the current barriers to implementing physical sustainable mobility projects.

3.1 DEFINING SUSTAINABLE MOBILITY

The usage of sustainability principles in urban transport plans have continued to become more common, for example the creation of Sustainable Urban Mobility Plan guidelines[1] for use in transport planning practice. Similar to the umbrella term 'sustainability', 'sustainable mobility' does not have a conclusive definition. However, the European Commission notes that the objective of a sustainable transportation is "to ensure that our transport systems meet society's economic, social and environmental needs, whilst minimising their undesirable impacts on the economy, society and the environment." (EC, 2006, p.10)

To further this explanation, Schiller et al. (2010) proposes that a sustainable transportation system should provide:

- Individuals with basic access needs and allow equal access to all citizens.
- Transport options that support the city's economy, whilst also providing a range of affordable options for individuals.
- Transportation modes that limit the use of non-renewable resources and reduce emissions.

An environmentally sustainable, integrated, efficient transportation system allows for greater urban quality of life, and therefore plays a substantial role in reaching the vision of a sustainable city. Giduthuri (2015) notes a connection between having integrated transport system modes, and quality of life in the urban area. In light of this, cities that rank high in quality of life regularly also have extensive urban transport systems, which give priority to non-motorized modes and public transportation.

[1] 'Guidelines: Developing and Implementing a Sustainable Urban Mobility Plan' provided by the European Commission, to assist transport and mobility practitioners' in developing and creating their own Sustainable Urban Mobility Plan.

Discussions surrounding sustainable mobility have generally focused on two areas: The increased use of technology innovations, e.g. alternative fuels, to reduce environmental impact and institutional innovations to create more sustainable practice and policies leading to behavioural change (Homrighausen & Tan, 2016).

3.2 SUSTAINABLE MOBILITY PARADIGM

In spite of the general acknowledgement regarding the requirement to reduce fuel emissions that drive mobility practices, this is juxtaposed with societies' unsustainable mobility practices (Banister, 2011). Therefore highlighting the issue of balancing mobility planning with the imminent economic and demographic growth, to still allow for a sustainable transportation system, which reduces the negative environmental impact of mobility practices (Næss et al., 2011).

The sustainable mobility paradigm, as outlined in Banister's 2008 article, draws on the movement from conventional transport planning towards an alternative paradigm of sustainable mobility. Banister (2008) argues that in order "to achieve sustainable mobility, the arguments must be sufficiently powerful to overcome the dependence on the car and the possibility that the costs of delay and congestion have already been internalised by drivers." (p.79) Therefore arguing that, although steps have been taken in many cities across Europe to implement measures, further understanding is required in terms of how to effectively implement these measures at a local level.

In order to move towards a sustainable mobility paradigm, four major areas to achieve sustainable mobility are:

- Technology: investment and innovation in transport technology, such as information systems and investment in alternative fuels.
- Demand management through regulation and pricing: includes higher fuels prices and road user charging.
- Land-use development: integrated planning that encourages shorter travel distances for citizens.
- 'Soft' mobility measures: awareness campaigns and persuasive marketing to the individual citizen, as acceptability is emphasised as the essential part of reaching targets within sustainable mobility.

(Holden, 2007; Banister, 2008)

These areas of progress highlight the comprehensive nature of sustainable mobility, with both measures that positively encourage the use of sustainable modes of transport and measure that make the use of un-sustainable modes less attractive.

A significant barrier preventing a shift towards the sustainable mobility paradigm is the form of assessments undertaken in transport planning practice when selecting beneficial projects. It can be argued that the conventional approach to transport planning focuses heavily on economic evaluations and forecasting traffic. A shift towards sustainable mobility requires a focus on both the environmental and social effects of mobility, through multi-criteria analysis, in order to fully assess the impact of new projects. (Marshall, 2001; Banister, 2008)

Non-motorised transportation can be seen as a way to further the effort in pursuing environmental and social sustainability of the transport system. The implementation of projects that encourage and allow for non-motorised transport modes to thrive in urban areas is necessary but also comes with a number of barriers to successful use, which can be categorised into infrastructural, social, cultural, financial, technical and administrative barriers. For example, in terms of infrastructure, the barrier to overcome is the disregard of facilities required in infrastructure development for non-motorised modes. This can be overcome by planning professionals placing emphasis on safe and quality bike lanes and pedestrian spaces, making the pedestrian and cyclists space the top priority on the roads. (Yedla, 2015)

3.3 EUROPEAN POLITICAL DISCOURSE ON 'SUSTAINABLE MOBILITY'

In addition to more advanced sustainable mobility systems being linked to quality of life in urban areas, which brings economic and social benefits to the local region, the environmental benefits have also been made clear in a European context. The need to reduce the environmental impact of transport in Europe can be linked to the fact that 23% of EU emissions are currently derived from transport (EC, 2016). Therefore in order to move towards the vision of sustainable urban areas, it is increasingly vital to implement a sustainable transport system. The European Commission have highlighted the importance of environmental protection within transport policy agenda, with the concept of sustainable mobility being apparent in much of the political discourse at the European level. It has been noted that the supranational European Union has the potential to provide concise sustainable mobility principles and guidelines, in order to assist governments at the local level in reaching more sustainable mobility systems, and acquiring the benefits that this can potentially create (Attard and Shiftan, 2015).

One of the major political discourses in the European context is the EU's 'White Paper on Transport', which every decade provides an authoritative report detailing Europe's stance on transport policy by showcasing the issues and potential solutions for transportation in the European Union. The 1992 White Paper on Transport[2], the concept of 'sustainable mobility' is presented as a main objective for transport

[2] 1992 White Paper on "The Future Development of the Common Transport Policy - A global approach to the construction of a community framework for sustainable mobility"

development in the future. The White Paper notes that future transport systems should aid sustainable development rather than hinder it, as well as providing a solution for environmental problems facing Europe (EC, 1992). Following on from this report was the 2001 'White Paper on Transport, which clearly provides four actions: "shifting the balance between modes of transport", "eliminating bottlenecks", "placing users at the heart of transport policy" and "managing the globalization of transport" (EC, 2001). These specific actions have been acknowledged as the key areas to improve, so that more sustainable transport systems can be achieved throughout Europe. The 2006 mid-term review of the 2001 White Paper, "Keep Europe Moving: a transport policy for sustainable mobility", clearly called for the changes to these four actions, in order to account for rapidly growing European urban areas and placing further emphasis on attempting to achieve increasingly rigorous global environmental commitments (EC, 2006).

The latest 'White Paper on Transport' was released in 2011, and underlines the importance of having a growing transportation system, which takes into consideration the need to be sustainable and resource efficient, due to the ambitious target of 60% reduction in greenhouse gas emissions, as well as also meeting the needs of a competitive Europe. The White Paper [3] suggests that as well as creating new technologies, there also has to be a shift towards more sustainable behaviour. This shift in behaviour requires that the European Commission actively encourage enhanced and more extensive sustainable mobility planning. The 2011 White Paper additionally promotes sustainable mobility planning in urban areas, by introducing the possibility of making Urban Mobility Plans mandatory requirements for cities of a certain size (EC, 2011). This indicates that the European Commission has commitment to increased sustainable mobility practices by making individual municipalities more accountable to examine and change their individual approaches to sustainable mobility.

The emphasis on sustainable mobility in European political discourse provides increased pressure to municipalities on the local level to adopt sustainable mobility projects, in order to reach ambitious environmental goals. This is of particular importance as 60% of all citizens in Europe live in urban areas, and therefore a sustainable, efficient urban mobility is vital to facilitate employment and economic growth in cities. While European cities differ greatly in characteristics, there are issues that affect the majority of urban areas, including air and noise pollution, congestion and high numbers of traffic accidents (EC, 2007). Despite sustainable mobility being at the forefront of transport policy in a European context for decades, the implementation of tangible sustainable mobility projects is now becoming more common practice at a local municipal level. Therefore, actors in the planning processing are currently

[3] 2011 White Paper: "Roadmap to a Single European Transport Area. Towards a Competitive and Resource Efficient Transport System"

having to decide what projects should be implemented and the potential effects these projects could have on the city and whether they will help municipalities reach environmental and livability goals.

EU policies and goals relating to Sustainable Mobility[4]
Requirement for new transport patterns, in which freight and travellers arrive at their destination using the most efficient modes. *(White Paper on Transport, p.6)*
Walking and cycling should play an integral part in urban mobility planning and infrastructure design. *(White paper on Transport, p.8)*
"Further synergies between public health and transport policy." *(Action Plan on Urban Mobility, p.5)*
A modal shift towards more sustainable transport modes should not compromise safety. *(Targeted action on urban road safety, p.3)*
CO2-free city logistics should be achieved in major urban areas by 2030. *(White Paper on Transport, p.26*
"Halve the use of 'conventionally fuelled' cars in urban transport by 2030; phase them out in cities by 2050." *(White Paper on Transport, p.9).*
"By 2020, establish the framework for a European multimodal transport information, management and payment system." *(White Paper on Transport, p.9)*
Aim to provide travel information through different media, including focused information for disabled people. *(Action Plan on Urban Mobility, p. 6)*
"Move towards full application of 'user pays' and 'polluter pays' principles." *(White Paper on Transport, p.9)*
Provision of demand-side incentives, including access to restricted areas, dedicated lanes and changes to parking policy. *(The deployment of alternative fuels infrastructure, p.19)*

3.4 THE GAP BETWEEN THEORY, POLICY AND IMPLEMENTATION OF SUSTAINABLE MOBILITY PROJECTS

As discussed above, the willingness to move towards more developed sustainable mobility practices in Europe has dominated transportation policies and strategies, since the first White Paper on Transport in 1992. Although municipalities are at varying stages in the pursuit of sustainable mobility, the European Commission has created a set of guidelines for Sustainable Urban Mobility Planning (SUMP) to encourage the introduction of sustainable mobility policies at a local municipal level. The SUMP guidelines provide support for municipalities when creating a sustainable mobility plan, in terms of

[4] European Commission documents were selected based on their relevancy to sustainable urban mobility. These were as follows: 2011 White Paper on Transport: *"Roadmap to a Single European Transport Area. Towards a Competitive and Resource Efficient Transport System*"; 2009 Action Plan on Urban Mobility; 2014 EC Directive on "*the deployment of alternative fuels infrastructure*"; 2016 EC Staff Working Document *"A European Strategy for Low-Emission Mobility"*; 2013b EC Staff Working Document *"Targeted action on urban road safety"* accompaniment to the Urban Mobility Package communication document *"Together towards competitive and resource-efficient urban mobility"*.

outlining what goals and general strategies can be put in place to create a shift in mobility planning at the municipality, towards more sustainable practices.

Despite the in-depth theory that exists on sustainable mobility, Homrighausen & Tan (2016) state how there is still a 'theory-practice gap' between the latest knowledge of best practice and advances in the field of sustainable mobility from a theoretical standpoint and the practical implementation of projects at a municipal level. A level of uncertainty still exists when it comes to the implementation process, with Banister (2005) highlighting the gap between individuals' behaviour and the assumptions made in policy creation on sustainable mobility. It is difficult to assess the probable outcome of particular sustainable mobility projects, and therefore even if municipalities have extensive policies encouraging sustainable mobility, the physical implementation of projects in line with policy goals can be missing in an urban context. When it comes to citizen awareness and acceptance of sustainable mobility, this can be influenced to a greater degree by physical projects that have been implemented, as opposed to local policies outlined in municipal mobility plans.

At the EU level, a number of websites exist to assist European municipal planners in sustainable mobility planning practice. These include, Eltis and CIVITAS, which provide planners and other interested parties with a database of completed or ongoing sustainable mobility projects. These websites allow planners to explore the successes and complications that have arisen from each project. This type of advances can be seen as a way to reduce the 'theory-practice gap' that exists in sustainable mobility planning.

Vergragt & Brown (2007) note the significant role that government institutions have in promoting a shift towards sustainable mobility. They can do this by a number of means, including, encouraging technological innovation, investing in sustainable infrastructure and organising debates surrounding change to the system as a whole. The way various stakeholders interact and are included in the planning process (Vergragt & Brown, 2007), and the need for active involvement and communication between different actors (Banister, 2008) are important to achieve change in the sustainable mobility planning process. Homrighausen & Tan (2016) underline the important role that both official organisations, such as municipalities, and local initiatives play in the field of sustainable mobility. Creating networks between actors helps support the sharing of innovative ideas. As well as filling the gap between slowly changing institutions and dynamic socio-cultural values present in the shift towards sustainable mobility. (Homrighausen & Tan, 2016)

Banister (2005) identified a number of barriers to implementing the ideal set of sustainable mobility policies, including:

- *Resource Barriers* – accessibility to the required physical and financial resources.

- *Institutional and Policy Barriers* – including disorganisation and lack of coordination between government or different organisations and the potential for conflicting policies.
- *Social and Cultural Barriers* – acceptability of projects/ policies by the public, and issues regarding whether to use push or pull measures to encourage use of sustainable transport.
- *Legal Barriers* – the ability to change or implement laws and regulations within the transport field.
- *Side-Effects* – the effects that a particular project has on the overall transportation system. The combination of projects can produce different results than expected when the projects are assessed individually before implementation.
- *Other Physical Barriers* – including space restrictions and topography of the urban areas.

Sustainable mobility projects may face a selection of barriers listed above, or others not mentioned, and the extent to which the barriers hinder the implementation of a project depends on how many and in what combination the barriers present themselves.

In addition, a policy-behaviour gap exists between policy-making in sustainable transport and citizens' behavioural responses. It is suggested that the many choices available to citizens can lead to unexpected responses that are not predictable during policy-making and can influence citizen responses to implemented projects. However, the behavioural responses are not always related to alternative choices but also reflect the poor implementation of projects. (Banister, 2005)

4 TACTICAL URBANISM

In light of the barriers faced by planners when attempting to facilitate a shift towards more sustainable mobility practices described in the previous section, tactical urbanism is presented by the researcher as a way planners are currently thinking about planning for the implementation of sustainable mobility projects and how its characteristics have the potential to make sustainable mobility planning more effective, democratic and lead to easier implementation of projects.

Hence, the following section aims to link planning theory with the practices of tactical urbanism, and to understand how this approach is currently being used in planning practice at a municipal level through global examples. The context in which tactical urbanism approaches have begun being implemented into formal municipal planning at the street level and what implications this has for the planner will also be discussed below.

4.1 DEFINING TACTICAL URBANISM

This research project defines tactical urbanism as:

"An approach to neighbourhood building that uses short-term, low-cost, and scalable interventions and policies to catalyze long term change". (Lydon & Garcia, 2015, p.2)

Tactical urbanism is a term first coined by Urban Planner Mike Lydon in 2010, who went on to develop the notion further in his 2015 book 'Tactical Urbanism: Short-term Actions for Long-term Change' when he observed new forms of place making occurring in the urban context. The term is associated and often intertwined with other approaches, such as DIY urbanism, guerrilla urbanism, pop-up urbanism, and temporary urbanism, among other names. Although tactical urbanism and DIY urbanism can be interrelated, the main distinction between the two is that tactical urbanism is intended to create long-term change, through upgrading infrastructure or policy change. Whereas DIY urbanism is temporary in nature and the activity itself can be more important than the long-term consequences. Lydon is a part of the New York based 'Streets Plan Collaborative', an institution working on promoting walkable, mixed use neighbourhoods through improving the quality of public spaces, with a particular focus on the tactical urbanism movement. An example of how Lydon has worked with municipalities is that he was a part of creating a Bicycle Action Plan for Miami, which was later supported by city politicians and planners. Additionally, it led to an increase of similar projects throughout the city, including the 'open streets' event, as government workers started to see the positive effects of these inexpensive and quick to implement projects. (Lydon & Garcia, 2015)

The benefits of tactical urbanism include:

- Providing a test scenario, in which data can be collected and evaluated to inform long-term implementation;
- Promoting citizen engagement by involving citizens in the evaluation of pilot projects;
- Optimising funding opportunities by being able to undertake more projects with less money and the ability to show the potential of individual projects.

(Mitman & Rixley, 2015)

Tactical urbanism projects involve publicly used spaces, even if owned by a private entity (Zimmerman, 2015) and respond to a broad set of issues, including the use of vacant spaces (Nemeth and Langhorst, 2014) and promotion of sustainable mobility in urban areas (Mitman and Rixley, 2015; Birdsall, 2015). Lydon & Garcia (2015) note that tactical urbanism should be seen as a way to quickly, incrementally and cheaply implement projects, with emphasis on increased citizen involvement and as a place-making tool, not as a replacement for the governmental planning process. These tactical urbanism projects can be used as a step to receiving larger scale investments once a project is tested at street level (Lydon et al., 2012). The movement can be seen as a way to be more responsive to unaddressed urban problems, with the ability to adapt depending on the results of these short-term actions. Tactical urbanism projects cover both sanctioned and unsanctioned projects, and the level of governmental involvement varies.

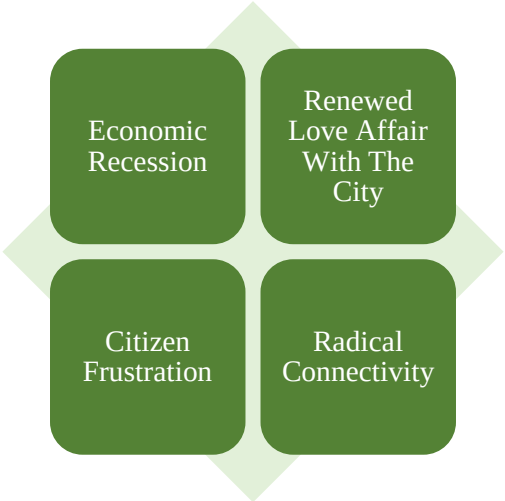


Figure 2: Global trends leading to a rise in tactical urbanism's popularity (Lydon & Garcia, 2015)

Although tactical urbanism movement has roots in unsanctioned, activist and community led projects, it has also been and is becoming even more apparent in more traditional forms of planning practice (Peck, 2005), potentially due to the global trends mentioned in figure 2. In addition to the trends mentioned in figure 2, it is also important to note the influence rapid population growth has on changing urban demands, therefore more responsive solutions become evermore vital (Brenner, 2015). Tactical urbanism allows for the an informal learning process, which in turn creates further understanding of how specific projects impact both the built environment and different communities, including the general public, politicians and planners (Marshall et al., 2015). Mould (2014) notes that these projects can be seen as an attractive option for municipal planners due to the implementation of low-cost, innovative projects within a short timescale, as long as the more 'unsanctioned' characteristics of tactical urbanism are removed. However, it requires consideration for how tactical urbanism approaches are used in official planning practice in order to ensure that the attractive characteristics, including the increased responsiveness to local issues, are still present in the projects once there is municipal involvement.

4.2 TRENDS IN URBAN PLANNING LEADING TO RISE IN TACTICAL URBANISM

Lydon & Garcia (2015) highlight the trends in current urban planning that have led to urban planners incorporating tactical urbanism solutions, that were previously unsanctioned, anarchist actions, into everyday planning practice. The four trends, as shown in figure 2, can be related to current theories in planning practice. Firstly, the renewed love affair with the city can be seen in the new urbanism movement, promoting livable urban areas with an emphasis on environmental and social sustainability.

Secondly, the trend of citizen frustration can be connected to the last two trends, economic recession and radical connectivity, with citizens becoming more aware of how they would like urban areas to function and growing use of technology providing citizens with an outlet to provide input on the planning process. Whilst the economic recession means that fewer large-scale municipal projects can be implemented due to lower budgets at a municipal level, leading to increased citizen frustration where projects are seen as important to local citizens. The citizens have become frustrated by the level of bureaucracy, and crave a more tactical, bottom-up approach to planning. Tactical urbanism provides citizens with the ability to see how a neighbourhood can be improved through small-scale projects, for example making improvements to the pedestrian and bicycle infrastructure can be experienced first-hand by the citizens, providing a vision of what can be potentially done. This can help citizens become more involved and see the potential of the urban areas they reside in.

In addition to adding to citizen frustration, the economic recession can be seen as having a major effect on the municipal planning system, with the increased funding cuts changing the way planning practice can

take place, leading to planners having to find alternative ways to reach the selected environmental, social and economic goals set at a municipal level. Lydon & Garcia (2015) note that in order to meet the goals set to create more liveable urban areas will depend on governments starting to work more tactically (bottom-up approach) and for citizens to think more strategically about urban problems. As well as the citizen frustration experienced, I argue that there is also a level of planner frustration, as planners often have to work within a system that is not flexible due to expense and projects taking too long to implement, therefore frustrations may arise when the planner is unable to reach goals and the vision they set out. Increased interaction with citizens in the planning process also is mutually beneficial to both the citizen and planner, as it allows for a reduction in concept fatigue by adding alternative, new ideas to the planning process (Pascua, 2007).

4.2.1 Origins in New Urbanism

Lydon & Garcia (2015) attribute part of the growing interest for tactical urbanism in the renewed love affair with the city, shown in figure 2. This love affair with the city is seen mostly within the demographic of the 'Millennials' (between the ages of 18 and 35), who are deciding against the car dependant, suburban living that characterised past generations living situations. Instead, 'Millennials' are choosing to move back to cities that promote walking, cycling and public transportation, whilst offering increased cultural, commercial and recreational amenities. (Lydon & Garcia, 2015) Lydon et al. (2012) have suggested that planning for a liveable city often starts at the street or block level, and therefore tactical projects can be seen as an effective approach to improving urban liveability.

Jane Jacobs' (1961) already argued in the 1960's that urban vitality is driven by mixed-use planning and community diversity, while the traditional planning at that time took away the liveliness from the city. In line with these thoughts was the creation of the urban design movement New Urbanism, which arrived in the United States in the 1990's, as a solution to the problem of suburban sprawl and inner-city degradation (Leinberger, 2009; Talen, 2005). In terms of urban planning, New Urbanism promotes the creation of land use policies that support "mixed-use, mixed-income, mixed-tenure, and transit-oriented development" (p.115). In relation to transportation, New Urbanism stresses the importance of the built environment supporting sustainable modes of transportation, whereby accessibility for pedestrians, cyclists and public transport users is paramount. (Trudeau, 2013)

Tactical urbanism and new urbanism can be seen as two contrasting concepts, as illustrated in the table below:

Table 1: Characteristics of New Urbanism and Tactical Urbanism (based on table 1 in Silva, 2016)

	Timescale	Context	Stakeholder involvement
New Urbanism	Permanent/ Durable	Vision on different scales, from the local level strategies to regional strategies.	Practitioners and Community involvement.
Tactical Urbanism	Temporary	Local level - from the building, street and block level.	Community involvement, alongside businesses and local advocates.

As shown in table 1, tactical urbanism projects are attached to a specific timeframe, however these temporary projects can, in some cases, evolve into permanent solutions. Whereas new urbanism projects have more capacity in terms of scale, so can also be strategic in nature. (Silva, 2016) Despite these differences in characteristics defining new urbanism and tactical urbanism, tactical urbanism has grown out of and thrived from the new urbanism movement (Silva, 2016). For example, the thoughts behind tactical urbanism project like 'Open Streets' can be closely linked to the walkable cities concept outlined in new urbanism. Tactical urbanism can be seen as sharing similar principles to new urbanism, which are to encourage pedestrian activities and reduce environmental impacts of transportation, whilst increasing accessibility, as well as encouraging economic, social and land-use diversity (Talen, 2005; 2015).

Chantry (2013) reiterated the thoughts of Andres Duany, a member of the Congress for New Urbanism, who noted the rise of the 'new New Urbanism'. He sees this new term as necessary due to the major shifts in planning practice: 'pervasive impoverishment' and 'psychological shifts of impending climate change'. Duany sees the importance of being adaptable and incremental in the economic downturn and planning for climate adaptation becoming evermore significant in planning practice. He therefore sees the advantages of tactical urbanism, and the growing importance of using tactical solutions in planning practice, in order to respond to the two major shifts in planning.

4.2.2 Tactical Urbanism and the 'Right to the City' Debate

Iveson (2013) connects the growth in "micro-spatial urban practices" (p.941), including tactical urbanism activities with the 'right to the city' concept, noting the potential for increased democracy in the city through these urban practices. In terms of the 'right to the city' concept, Henri Lefebvre first coined the term in his book *Le Droit* **à** *la ville* (1968). In a time when city planning was defined by rational, spatial and analytical logic, Lefebvre instead sought to make the distinction between the planned city and the practiced city. Therefore going against the planning logic by seeing the city as a lived place, where

inhabitants have the right to use urban spaces freely and have increased power to voice how spaces should be used. (Fraser, 2011) The 'right to the city' concept can be further connected to tactical urbanism approaches, due to the 'World Charter for the Right to the City' promoting policy change to take advantage of public private properties, which are underused or deserted (HIC, 2017). Addressing this issue can be seen as an important part of temporary tactical urbanism projects, whereby urban problems can be tackled in a short time span, and approaches adjusted depending on the present need.

Although there are many different ways of defining the 'right to the city' depending on the particular focus. Whether that focus is on urban studies, or on studies in equity, and social justice. Purcell (2013) argues that the following values are present in most policy and academic work into the 'right to the city':

- Emphasis on the user or inhabitant of urban space,
- The right to the city is reliant on everyday experience of inhabiting the city rather than on nation-state citizenship,
- The use value of urban space is more important than the exchange value.

Article II of the Habitat International Coalition's 'World Charter for the Right to the City' highlights the need for urban policies to place emphasis on collective social interests over individual property rights (HIC, 2017). These key aspects that define the 'right to the city' concept are thought to be at conflict with urban practice, whereby property rights outweigh the user rights, and therefore the use of space is determined by the exchange value and profit rates above other ideas of rights, for example, the cultural, social, and political value the space has for users (Lefebvre, 1996; Harvey, 2008; Purcell, 2013). Harvey (2008) adds to the notion of the 'right to the city' by noting that it needs to be seen as a common right, rather than individual, as the ability to transform urban spaces and reshape processes of urbanisation is reliant on exercising collective power.

If this is the case, then tactical urbanism provides an outlet for increased power for citizens, which is in line with Lefebvre's statement that citizens should have the right to access and be influential in the decision making process that generates space, as well as the right to occupy that space. Although it is often stated that tactical urbanism involves the individual, many projects have involved citizens taking leading roles in projects with involvement from many other stakeholders, both public and private in the process. (Fabian & Samson, 2016) Chantry (2013) noted that interventions like turning parking spots into parks and painting road intersections, show how urban designers and planners are taking the city back for the citizens and therefore creating spaces where citizens are the most important factor in the urban space. Tactical urbanism provides both government workers and general citizens to make incremental changes that empower the citizens of the urban area.

4.3 TACTICAL URBANISM IN PLANNING PRACTICE: A LITERATURE REVIEW

There are a number of notable pieces of tactical urbanism literature focusing on encouraging and providing guides to empower citizens to take back their neighbourhoods and take part in the 'place-making' process. (Walljasper, 2007; Hou, 2010; Lydon & Garcia, 2015). The following literature review focuses on recent articles that discuss the place of tactical solutions in planning practice, highlighting the complex relationship between planners and citizens in the implementation of tactical urbanism projects.

Year	Author	Title	Point of View on Tactical Urbanism in Planning Practice
2014	Finn, D	DIY urbanism: implications for cities	The article underlines the benefits of DIY urbanism, in that it encourages low-cost, innovative solutions to address urban problems. However, the authors also note the challenges that these solutions pose for urban governance and planning, as they do not follow formal processes. The article then proposes ways that the DIY movement can be harnessed positively in the planning process, noting the connection between DIY urbanism and the participatory aspect of urban planning and management. The possible ways include: creating programs to empower citizens to be more involved in the design and management of local spaces, and creating opportunities for use of DIY approaches. The planner's role is envisioned as managing and harnessing the DIY advocates' creativity, placing themselves as an ally to progressive citizen-led efforts, whilst ensuring safety, equity and effectiveness.
2014	Mould, O	Tactical Urbanism: The New Vernacular of the Creative City	This article provides a critique of the adoption of the tactical urbanism movement by politicians and urban planners to further the neo-liberal political ideology of the Creative City. The authors argue that although tactical urbanism started as a community-led, activist activities, it has now become divorced from the original ethos and is being used to promote neoliberal policies of urban development since the recession. In turn highlighting concerns of social, cultural and economic inequalities that have emerged via gentrifying processes. The authors conclude that tactical urbanism is part of the latest urban 'strategy' that positions alternative urban

			practices and moments of creativity into the urban hegemony.
2015	Leonard, R	Green Infrastructure grows up	Leonard's article addresses investment in green infrastructure in planning practice and what planners can do to promote further implementation of green infrastructure projects. The authors use tactical urbanism as an example of how to make cost-effective improvements to public space. Using the example of the "pavement to parks" project, to show how planning departments and transportation agencies are collaborating on tactical urbanism projects in order to create quick and cheap pedestrian spaces from underused streets. It is noted that these tactical urbanism projects have the ability to influence future implementation of green infrastructure, as the temporary projects allow for proof of effectiveness before policy changes can be put in place. The article concludes that although tactical urbanism and pilot projects can provide a useful starting point for green infrastructure investment, there has to be emphasis put on a system-wide approach by planners.
2015	Marshall, W.E et al.	Large-scale tactical urbanism: the Denver bike share system	The article uses the Denver bike share system as an example of a large-scale tactical urbanism project, which started out as a temporary solution to promote green transportation in the city. However, the potential for this project to be turned into a permanent solution was predicted. The project allowed for the local community to be more involved with the on-going process of collecting data and adapting the solution before permanent implementation. The authors note how important implementing a tactical urbanism solution was in a city that was traditionally a car-orientated city, in order to create innovative changes in urban transportation. The article concludes that the tactical urbanism approach also helped in reducing the knowledge controversies apparent among the stakeholders and in doing so promote cycling in the city.

2016	Silva, P	Tactical urbanism: Towards an evolutionary cities' approach?	The article notes the current perception of tactical urbanism as a challenge to and in opposition of formal planning tools, and points towards the need to have a planning system that is more responsive. A difference between tactical urbanism and traditional planning institutions is that the institutions look for malfunction whereas the tactical solutions are based on waste of space. The authors' note that the ability for citizens to present situations that need to be altered is not used enough in the current planning system. Alongside this there is the advantage of cities being able to use tactical urbanism solutions as tests to solve a particular issue. However, the authors highlight the main potential problem of finding a role for tactical urbanism actions in the planning processes and in plan-making in particular.
2016	Fabian, L & Samson, K	Claiming participation – a comparative analysis of DIY urbanism in Denmark	In the Danish context, this article contributes to the literature on how DIY urbanism can be used to strengthen citizen participation in the production of space. The potential conflicts and potentials of DIY urbanism when integrated in urban planning strategies is discussed, with the authors concluding that DIY urbanism is growing in relevancy due to environmental and economic crises. This is because it allows us to look at the urban environment as something to be changed, reused and seen as a valuable resource. The article uses the Carlsberg case; to argue that DIY urbanism should be adopted in the planning process further as it allows for best practice solutions to be developed, with input from a diverse range of stakeholders.
2017	Barata, A.F. & Fontes, A.S.	Tactical Urbanism and Sustainability: Tactical Experiences in the	Barata and Fontes provide the only article that makes a direct connection between tactical urbanism and sustainable mobility, in particular the promotion of active transportation. The article highlights two different ways tactical urbanism has been used: for the "Protection and Prioritization of Active Transportation Means" (p.692), which shows how tactical urbanism has led to safer conditions for pedestrians and cyclists. Examples of permanent

		Promotion of Active Transportation	'Build a Better Block' and temporary road closures are provided. The second form of tactical urbanism is "Subversion of Uses in Public Spaces" (p.693), which encourages changes in lifestyle and behaviour, showing the importance of active transportation as an alternative to motorized vehicles. The examples used for this is the 'Pavement to Plaza' as a permanent example and 'Parklets' as a temporary solution. The authors conclude that the permanent actions had more impact than the temporary actions, in terms of encouraging active transportation.

The literature review focuses on articles, which add to the discussion of tactical urbanism in local planning practice context. The majority of the literature weighs up the opportunities and challenges associated with tactical urbanism based on specific outcomes of tactical projects, whether it be the opportunities to further public participation in the planning process (Finn, 2014; Mould, 2014; Marshall et al., 2015; Silva, 2016; Fabian & Samson, 2016), presenting challenges to the current planning system (Silva, 2016) or the opportunities in the formal planning process for allowing increased collaboration between planning departments and transportation agencies, in order to develop innovative new approaches to mobility planning (Leonard, 2015). An interesting emerging pattern in the literature is the increased use of tactical approaches when planning for cycling in urban areas. Baratas & Fontes (2017) focus on the promotion of active transportation through permanent and temporary tactical urbanism projects, and Marshall et al. (2015) use the example of a bike-share system as a large scale tactical urbanism project, to illustrate how important adaptive solutions are before the implementation of permanent solutions.

The articles reviewed above focus on particular cases of tactical urbanism projects in relation to supporting sustainable modes of transportation, however, without an explicit focus on sustainable mobility (apart from Barata & Fontes, 2017). Whereas this research article aims to present the opportunities and challenges of tactical urbanism approaches being used specifically in sustainable mobility municipal planning, using stories from planners' working with mobility planning in practice. The reviewed articles provide a knowledge base regarding the current opportunities and challenges on which to analyse whether the planners' interviewed are experiencing similar changes in planning practice.

4.4 TACTICAL URBANISM AT THE STREET-LEVEL

Lydon & Garcia (2015) highlight two common ways that tactical urbanism has been applied in municipalities. These are:

- A tool used in the project planning, delivery and development processes, to engage citizens. And;
- As pilot projects, in order to test effects before further investment is made in the long-term.

In terms of being a tool for engaging citizens, it can be very beneficial to show planned changes physically, as opposed to theoretically mentioned at planning meetings. This is also meant to encourage a broader group of people to be interested in the projects when they are shown in a real life setting. Secondly, the use of tactical urbanism as pilot projects can allow for projects to be tested and data collected on the potential impacts and possible adjustments before the first stage in long-term implementation occurs. (Lydon & Garcia, 2015)

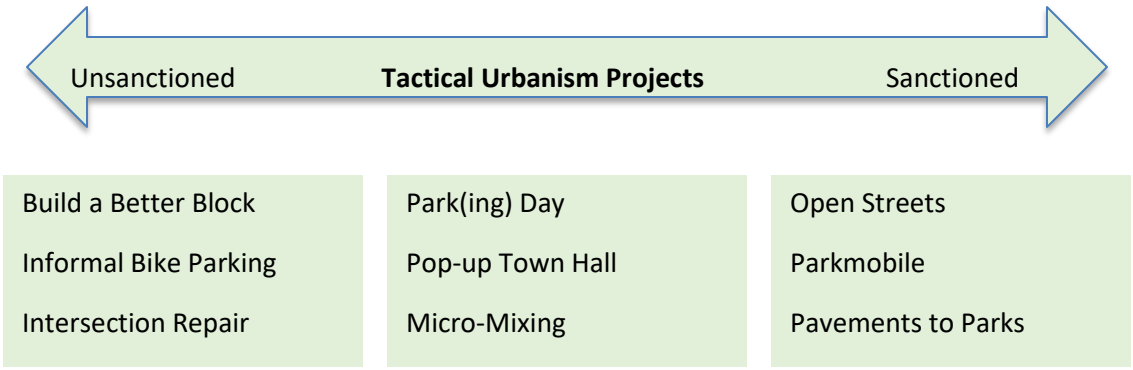


Figure 3: The Tactical Urbanism Spectrum (Based on The Street Plans Collaborative, Lydon & Garcia, 2015, p.9)

The above figure represents a number of the tactical urbanism projects that have been implemented in the United States, however many of these projects have also been implemented in a European context. Figure 3 emphasises that tactical urbanism projects lie on a spectrum, and are not static, due to some of these projects starting as unsanctioned, however, becoming sanctioned over time due to the successful outcomes.

The following examples are tactical urbanism projects that have been adopted on a global scale, and then an example of how this has been implemented in a European city.

4.4.1 PARK(ing) Day

Some tactical urbanism activities have incorporated both place making and sustainable mobility, as is the case with the PARK(ing) Day event, which involves creating more creative public spaces, whilst also discouraging the use of private vehicles as the predominant urban mode of transport. This event happens

Rebar's San Fransicso pilot 'parklet' (Source: Park(ing) Day Manuel Booklet, Rebar, 2009)

annually around the world and involves citizens, artists and designers transforming parking spots into temporary parks. The event originated in San Francisco when a design studio, Rebar, converted the first parking space in 2005.

Ever since, the event has grown in popularity and can be seen in cities across the world. The events are "the product of legal and collective efforts to transform space" (Iveson, 2013). One of the characteristics that have made this event popular is the adaptability of the concept to any urban context, so communities can identify their own values and issues that need to be addressed. (Rebar, 2017)

Although the park(ing) day event purpose was to challenge the way people see public urban space and empower people to reclaim the space (Rebar, 2017), the inspiration was that:

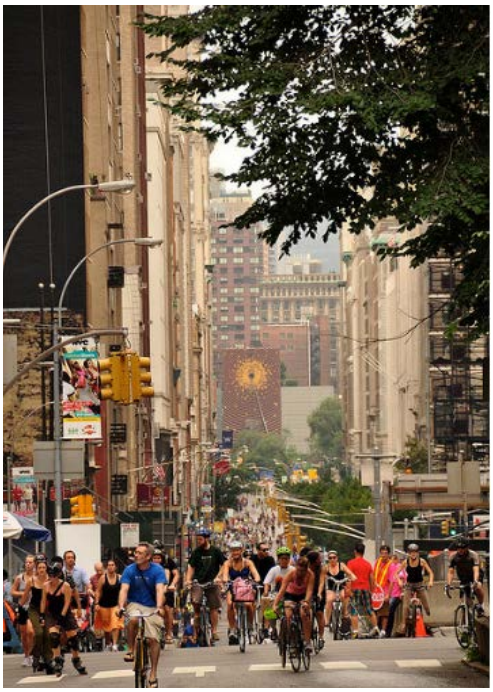
"The vast majority of outdoor urban space is dedicated to the private vehicle, while only a fraction of that land is allocated to open space for people."

Therefore it has also had the effect of encouraging sustainable mobility practices by making both citizens and practitioners reassess the space dedicated in cities to private vehicles. Highlighting that the focus in the city should be on people, with priority given to making urban areas safer and more attractive to pedestrians, cyclists and public transport users.

4.4.2 Open Streets Events

As is the case with the Park(ing) Day movement, the Open Streets Project also aims to change how people view public space, with an emphasis on temporarily using streets where private vehicles are not prioritised. By closing streets to automobile traffic it presents opportunities for prioritising sustainable transportation modes, including walking and bicycling, as well as creating new spaces for socialising and play. (Street Plans Collaborative, 2017)

Open Streets is an advocacy project started in 2010 and also led by the Street Plans Collaborative. Since the implementation of the first Open Streets project in the United States, it has been introduced in cities globally. Although this project has routes in advocacy, close interaction with city officials is paramount to the success of the project. (Street Plans Collaborative, 2017) This is due to the need to close streets, and therefore safety and traffic issues have to be considered in order for the project to go ahead. However, despite the potential issues relating to Open Streets projects, many cities have seen the advantages of this project, in terms of helping to meet governmental environmental, social, and public health goals.



Example of an Open Streets Event (Source: Open Streets Project website. Street Plans Collaborative, 2017)

4.4.3 European Context

Although the mentioned examples above illustrate how the tactical urbanism movement originated in the United States, many European cities have followed the examples and have adapted the concepts to individual European contexts. The Finnish city of Tampere have used the temporary 'Open Streets' concept in the effort to promote long-term changes to the city, in line with liveability goals. The city closed certain roads to private car use in the summer of 2014, as a way to test the system before the implementation of a permanent tram system in the area. Therefore, experimenting with different ways the street space could be used once the tram system is in place, for example by widening pavements to include space for park lets and terraces. However, the project was met with strong opposition from certain businesses and citizens, who disagreed with reducing access for private cars. This opposition is an issue experienced in many cities attempting to make changes to the urban status quo, and highlights a major issue faced in the urban planning field of cities shifting towards dense urban growth from the focus on promoting urban sprawl. (Timbal, 2015) In the case of Tampere, a strong political backing for the project meant that the project was successfully implemented. However, this illustrates the importance of a strong political vision for a more liveable city when attempting to apply these tactical urbanism approaches, despite them being temporary and low-cost solutions.

4.5 TACTICAL URBANISM: THE PLANNER'S ROLE

On the wave of what has been defined as the communicative turn in planning theory, a scientific trend has developed from pragmatism, highlighting the importance of experience over theory alone, within

planning practice. Communicative planning involved developing new connections between stakeholders, whether between the state and citizens or between different governmental departments, in order to address issues that had been ignored. This was moving away from the traditional focus on the bureaucracy and technical procedures involved with planning practice. (Healey, 2012) Planning is thus being understood as a very practical activity whereby problems are addressed and progress in theory also takes place (e.g. Hoch, 1996; Fischler, 2000). A level of importance is placed on how planning is done and performed, and the way forms of knowledge work together and evolve to reach particular solutions. Placing emphasis on the 'social micro dynamics of practices' (p.333), therefore leading to an interest in how policies are implemented and to understand why there are gaps in the implementation process. (Healey, 2012) Communicative and deliberative theorists suggest that a planners role should be able to facilitate the democratic decision making process, in order to make changes based on local problems (e.g. Healey, 1996). It has to be considered that a planning process that is more deliberative in nature can have negative effects, notably the potential for certain voices to be neglected, especially from marginalised groups, and the difficulty in balancing the power balance between the state, citizens and businesses in the planning process in order to make the process more democratic. (Healey, 2012)

The communicative turn in planning theory moved away from the notion of the planner as a definer of the truth, as was accepted in rational planning. Sager (1994) argues that both technical and discursive knowledge is important in the planning process, by considering both communicative and goal-seeking rationality. Deliberation in planning theory has then emphasised the importance of skills in interpersonal relations, a capacity for learning and empathy, an ability to work in an environment where there is constant conflict at play, and the ability to get things done (Friedmann, 1987). This has been a move towards seeing the planner as a deliberative practitioner. Donald Schön (1983) in the *Reflective Practitioner* showed how a planner's proposal, for example, could produce unexpected practical implications that change the present situation, however small or large. Schön clearly argues that there must always be 'reflection in action' during the planning process, with constant reassessment of the theories that were used when establishing the original proposal, and an ability to learn from attempts to change the current situation (Forester, 1999). Fischler (2012) notes that:

"Practicing reflectively means learning by doing and learning from doing; at best, it means pushing the boundaries of one's field and questioning one's role in it."

The above quote highlights the need for planners' to provide alternative strategies in planning practice, in order to create change towards the desired shift in planning furthering sustainable mobility at a municipal level. The ability to 'learn in action' is paramount, in order to seek changes in opinions and practices in transport planning, and the ability to plan in ambiguous urban contexts is vital due to the movement

towards a sustainable mobility paradigm being defined by uncertainty. This research project argues that tactical urbanism can be seen as an approach to help facilitate the shift towards more sustainable mobility practices due to tactical projects providing an alternative role for planners. In formal planning practice, barriers to implementing sustainable mobility projects can be reduced by taking a tactical approach, in which planners are able to experiment with tactical, temporary initiatives that create low risk improvements and encourage citizen involvement in projects. However, at the same time the position of tactical urbanism in planning practice and what role the planner should be are in question due to the early stages of implementing tactical solutions in a municipal context. The daily municipal practices need to be adapted to facilitate tactical projects and be able to accommodate uncertainty in the municipalities. However the more communicative characteristics, like citizen involvement, and the idea of planners' being reflective practitioners, make this shift possible to a greater degree.

Deliberative planning theory advanced by Donald Schön and John Forester have both based their work on using stories told from the planners perspective, in order to gain knowledge on how planners' in different planning situations deal with practices that are essential to the planner's role, including mediation, negotiation and conflict resolution. Schön (1983) saw that planning practice has to deal with levels of instability, uncertainty, uniqueness and value conflict, therefore presenting issues for planners when making decisions and choosing techniques and performing analyses for particular projects. Forester built on Schön's original work, through his book called The Deliberative Practitioner that took into account the political settings in which stakeholders partake in deliberation. Forester's work noted that as well as the planners having to adapt their current practices to be more reflective and accommodate more uncertainty in the planning process, the planner also has to understand and work with the political nature of planning practice. The political nature of planning practice involves many stakeholders and understanding the needs of both the politicians and the citizens. The requirement for planners to be politically astute is vital due to the often changing and uncertain arena of municipal politics.

In terms of sustainable mobility planning it is important to consider that, "planning for innovation must acknowledge the role of non-rationality and uncertainty in decision making." (Fischler, 2012 p. 319) Homrighausen & Tan (2016) argue that in order to attain sustainable mobility innovation is paramount, including innovative improvements to "practices, governance forms or even norms towards a desired goal of sustainable mobility" (p. 152). New sustainable mobility projects require a degree of innovation and consequently require a planning process that is adaptable to uncertain consequences relating to the implementation of projects. There is no standard or normative model that can be applied to solve public planning problems.

The exact role a planner should take in tactical urbanism projects is unclear, with arguments that planners should implement tactical projects into planning practice and incorporate citizens in this process. Whereas others argue that it is important for both sanctioned and unsanctioned to coexist and for planners to respond to the problems that citizens have identified through unsanctioned projects. Planners are traditionally seen as the opposite of someone who implements tactical projects, as they work with specific political and legal guidelines in their profession. However, tactical approaches to planning can be seen as a tool for planners to reach larger strategic goals by implementing short-term projects that help municipalities reach wider strategic goals.

5 'TACTICAL SUSTAINABLE MOBILITY'

This section aims to put forward the research projects concept of 'tactical sustainable mobility' by providing a discussion of how this research project defines 'tactical sustainable mobility'. Followed by insight into how tactical approaches are being discussed as part of the future of sustainable mobility planning, using the example of a Climate-KIC mobility seminar.

Section 3 provides knowledge on current sustainable mobility practices at the European municipal level and the barriers to implementing sustainable mobility projects despite general acknowledgment in planning practice that sustainable mobility is required in urban areas. Section 4 follows with an exploration of the characteristics, benefits and increasing trends of using tactical urbanism approaches in planning practice as a way to facilitate further development of sustainable mobility in urban areas.

Despite the use of tactical approaches for sustainable mobility planning at a municipal level, planners are often not aware of the term tactical in planning practice and do not explicitly label projects as tactical. This could be in part due to the association between tactical projects and unsanctioned projects undertaken by individual citizens. In addition, there are very few sources that planners can use to understand how tactical approaches can benefit sustainable mobility planning at a local level. Municipal planners also may not see projects as tactical, however use tactical approaches due to the global economic, social and environmental trends effecting urban planning, shown in figure 2. As the trends of economic recession, renewed love affair with the city, citizen frustration and radical connectivity have all led to planners having to reassess the way they approach planning. Section 4.2 illustrates the reasons why tactical urbanism has grown in popularity in urban planning practice in general. Based on this the research project aims to explore the use of tactical approaches in current European municipal contexts, specifically in regards to how tactical characteristics are present in sustainable mobility planning projects undertaken by municipalities. The term 'Tactical Sustainable Mobility' can be used to describe how planners are approaching sustainable mobility planning with a tactical mindset. Incorporating tactical characteristics, including low-cost temporary and scalable, to a sustainable mobility project in a municipal context can allow for pilot projects to test the impact of a mobility project in a specific geographical context, and as a citizen engagement tool throughout the planning and implementation processes (Lydon & Garcia, 2015).

This research project argues that planners can benefit from explicit acknowledgment of the need to approach sustainable mobility planning from a tactical perspective, in addition to long-term, large scale infrastructure planning. 'Tactical Sustainable Mobility' can be seen as a necessary approach to promoting a shift in mobility practices, as looking at sustainable mobility tactically provides a space for increased innovation that is required for significant changes. This is tactical approaches allowing for innovative

ideas/projects to be tested while on a low budget and proving the opportunity to increase citizen involvement in the planning process and implementation stage in new ways that go beyond public attending public meetings (Mitman & Rixley, 2015).

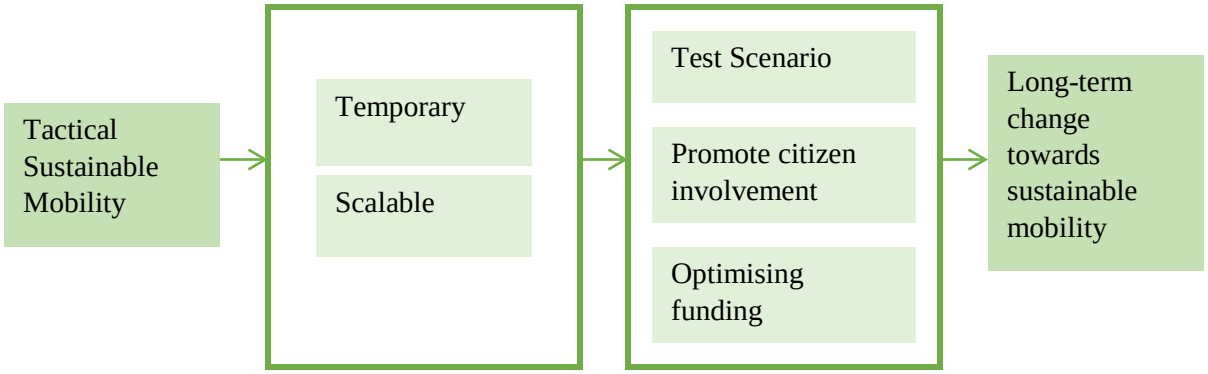


Figure 4: Tactical Sustainable Mobility: Characteristics and Benefits

The figure above highlights the main characteristics chosen in this research to define 'tactical sustainable mobility' followed by the benefits of tactical approaches, in order to reach long-term change in the shift towards more sustainable mobility practices in urban areas. From section 4.1, the characteristics of temporary and scalable were chosen as the two main characteristics that define and make tactical approaches different. Temporary describes the short-term, interim, transitory nature of tactical sustainable mobility projects, and scalable describes the tactical sustainable mobility projects that are implemented on a small-scale but can be expanded on a larger scale in an urban context if the test project is successful. Both these characteristics provide the ability to implement projects with limited funding opportunities, whilst testing projects in uncertain urban contexts and promoting the engagement of citizens in all aspects of the decision-making and implementation processes. In order to meet the end goal of creating a long-term change in urban mobility towards more sustainable practices.

In terms of planning for sustainable mobility and promoting a shift in the paradigm towards sustainable mobility practices, a pattern of moving towards more tactical solutions is apparent even though not explicitly stated by municipal planners. Figure 5 highlights the main areas of discussion at a mobility seminar attended by the researcher, which provided insight into sustainable mobility from a municipal, consultant and researcher perspective. Although not every topic discussed was related to tactical approaches to mobility practices, a number of the points made were related to the characteristics of 'tactical sustainable mobility'. Firstly the transport consultant, Christer Ljunberg, notes that one of the opportunities in transforming mobility practices in urban areas is the need for further innovation in the field. I argue that tactical approaches can provide a space for innovation to flourish, as the temporary and

scalable characteristics allow for new innovative ideas to be tested in real urban contexts and adapted based on the results of initial tests. This can be seen with the increasing popularity of living labs, for example, Copenhagen's Street Lab that tests innovative smart city solutions in real urban spaces (Copenhagen Solutions Lab, 2017).

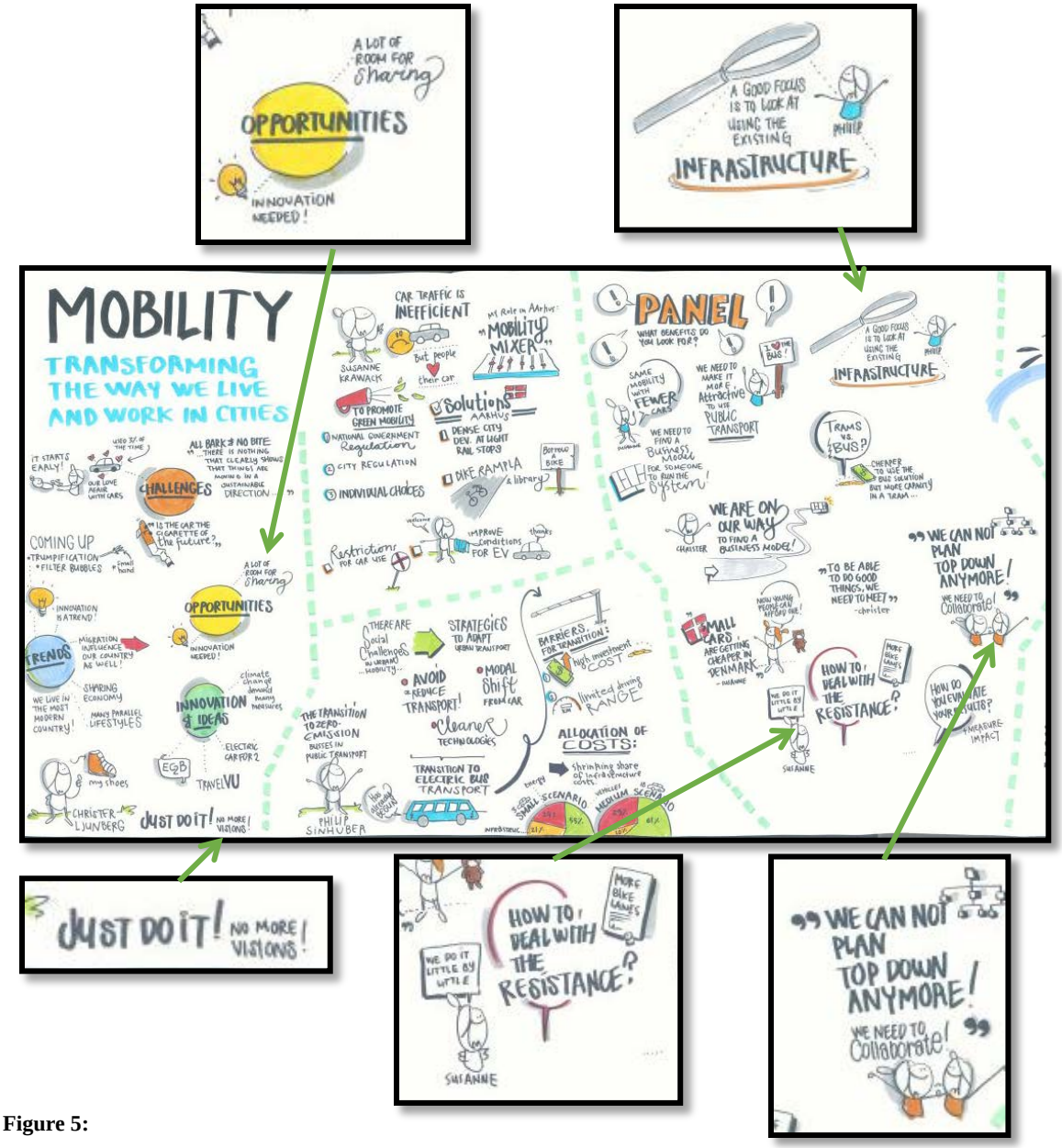


Figure 5:

Illustration from Climate-KIC Urban Transitions Workshop, Mobility seminar (Illustration produced by Climate-KIC representative) [5]

[5] Climate-KIC Urban Transitions Workshop, Mobility seminar, attended by researcher on 28/11/16. Presentations by Christer Ljunberg, Trivector Traffic AB; and Susanne Krawack, Aarhus Kommune, followed by a panel discussion.

Additionally, Christer voices the frustration that is often felt when he says “Just do it! No more visions!” Once again this can be related to an increasing focus on thinking tactically and avoiding the gaps that were highlighted in section 3.4, with sustainable mobility solutions being presented as the end goal in cities long-term visions. However, the actual implementation of projects that could facilitate a shift towards sustainable mobility practices do not always follow through to the completion of physical projects. This isn’t diminishing the importance of having visions, rather how there has been an excess focus put on creating visions at the possible detriment to actually implementing projects. Along similar lines, Susanne Krawack from Aarhus Municipality notes that they plan ‘little by little’ for sustainable mobility. This highlights the incremental side to municipal planning practice. There is a scalable aspect to incremental planning, as there is the ability to implement projects on a small-scale and when the budget allows, then expansion to the project can happen once established in one urban area. She notes the importance of incremental planning in increasing citizen acceptance of mobility projects.

Finally, the panel discussion highlighted the ongoing desire to have planning and implementation processes that are more collaborative, with the notion that planning from the top down is not an efficient way to plan for sustainable mobility due to the multiple stakeholders involved with mobility planning, and presents barriers to success if citizens are not involved with the planning process and at the same time are not invested in changing their behaviour to facilitate more sustainable mobility practices. The focus on collaboration is in line with the communicative planning theorists opinion that the planner should facilitate a democratic decision making process (Healey, 1996) and in order to do that all stakeholders have to be encouraged to be involved in mobility planning at all levels, from the decision-making to assessing implemented projects. ‘Tactical sustainable mobility’ should allow for more collaborative planning processes, as the characteristics of being temporary and scalable allow planners to involve citizens and other stakeholders in the new ways other than just public meetings.

The views from stakeholders in the mobility seminar highlights how actors involved in mobility planning are considering the characteristics of ‘tactical sustainable mobility’ when thinking about the future of mobility planning. The innovation required, in order to make a significant shift towards sustainable mobility, benefits from temporary and scalable solutions in order to be adaptable to the uncertain results of mobility practices in the urban context.

6 METHODOLOGY

The following section describes the process by which the research data has been collected, how the data will be analysed to answer the research question, and a discussion on the validity and reliability will then follow.

6.1 DATA COLLECTION

6.1.1 Chosen Method: Semi-Structured Interviews

The interviews with a range of European municipalities provided insight into sustainable mobility planning in practice, precisely focusing on the process of implementing sustainable mobility projects. The use of semi-structured interviews was beneficial due to the lack of knowledge on the researcher's part, regarding the difficulties and progress surrounding sustainable mobility projects at a municipal level, before the interviews took place.

In this research project, interviews were chosen as the method of data collection to answer the research question. Farthing (2016) notes, "knowledge is a socially constructed" (p.19), therefore it is important to use qualitative methods to understand how different municipal workers approach planning for mobility. The social and political aspects of urban planning mean that qualitative methods are either required or greatly enhance the research, in order to fully explore planning phenomena. Semi-structured interviews were selected, instead of structured or unstructured, as the research was exploratory in nature and therefore semi-structured interviews allowed the interviewee to talk freely about their opinions and thoughts. Encouraging the planner to provide personal stories and insight into planning practice from their perspective. Cochrane (2013) highlights the usefulness of the semi-structured approach when undertaking interviews with professionals.

In addition, this method allows for the interviewees to provide insights with minimal influence from the interviewer, while still covering the required topics due to the basic structure to guide the conversation. The method also allows there to be a focus on second questions, involving active listening and interaction between the participants, which in turn can lead to more insightful results (Kvale and Brinkmann, 2015).

The use of interviews is a powerful tool in understanding the planners' role in a project, and semi-structured interviews provide a situation whereby the interviewee has the possibility to tell a story, which is a powerful tool to present a complex series of events and assess the legal, moral or political obligations of involvement in projects (Forester, 1999)

6.1.2 Telephone Interviews

In order to undertake the semi-structured interviews, telephone was chosen as the preferred method of data collection. A number of advantages can be seen from telephone interviews, as they allow for less time and travel costs for the interview process. This is not only beneficial for the researcher, due to the time constraints of the research project, but also for the planners who have a very busy schedule. This method of collection allowed for one-hour interviews to be conducted with municipal planners across Europe, which would not have warranted the costs incurred with a face-to-face interview. Another advantage of the telephone interview is that the interviewee is less likely to be distracted by the interviewers reactions, and therefore can focus on providing answers with reduced outside influence (Bryman, 2012). However, Bryman (2012 notes it can be harder to have an extended interview over the telephone compared with the face-to-face interviews. In the case of this research project all participants put aside one-hour for the interview process and were willing to talk for as long as needed to finish all questions that had been prepared.

6.1.3 Location

To obtain the data required, semi-structured interviews were undertaken with municipal planners in Europe. Europe has been chosen as the focus area due to the location of the researcher and interest in how the ambitious European Union requirements, in regards to sustainable transportation, are being translated into the implementation of projects at the local level. The particular municipalities were selected based on preliminary research into which cities currently have progressive plans in sustainable mobility.

6.1.4 Data Collection Preparation

The interview sample was chosen by selecting 20 European municipal planners who work specifically with sustainable mobility practices. All the selected potential interviewees would have been relevant for the research project. From these original 20 planners, 6 provided a positive response to the project and agreed to participate in an interview.

The preparation for the interview stage involved email correspondence with the willing municipalities, where the planners were made aware of the topics and potential questions of the interview, in order for them to know what to expect from the process. The questions provided to the interviewee are shown in the interview guide (appendix 11.1). The provision of an interview guide allowed the interviewees to become more familiar and comfortable, and in some cases prepare information that would be useful to the research. The impact that the choice and phrasing of questions can have on the answers was considered, with ‘how’ questions being predominantly used instead of ‘why’ questions, as they fitted the exploratory line of questioning aimed at understanding the current process of sustainable mobility planning when little information was previously known. However, the semi-structured nature of the interview meant that

'why' questions could be added where appropriate during the interview process. 'How' questions also led to a more relaxed interview and allow the planners to open up further, as 'how' questions are generally seen as positive when compared to 'why' questions (Yin, 2003).

6.1.5 Data Collection Process

The interviews took place over the phone between November and December 2016, with the following planners:

- Helene Albinus Søgaard – Project Assistant, Mobility and Urban Space
- Christin Berg – Planner at Stavanger Kommune
- Røar Børresen – Head of Bicycle initiatives at Stavanger Municipality
- Jacky Nieuwstraten – Advisor for the City of Amersfoort
- Jeppe Andersen – Transport Planner at Aalborg Municipality
- Teresa Nielsen – Project manager in the Energy City Department at Skive Municipality

The interviewees have different positions within transport planning in their municipalities, with some of the selected planners working with mobility on the strategic scale, for example Jacky Nieuwstraten, Christin Berg and Helene Albinus Søgaard. Whereas, Røar Børresen works specifically with the implementation of bicycle projects at the street level and Teresa Nielsen is working in a cross-disciplinary way, seeking to integrate mobility into the work currently being undertaken in the Energy Department. The diversity of positions held by the interviewees allows for a more comprehensive set of results, in terms of how municipalities are currently planning sustainable mobility projects.

The interviews were undertaken over the phone due to convenience for both the researcher and interviewee. The interviewee's were given the option to choose between the phone and Skype as a way of communication and all interviewees selected phone as the preferable method. The option to not use face-to-face interviews was also due to time constraints and varied geographical locations of the selected municipalities. Both an audiotape and hand written notes were taken during the interview, in case the audio recording failed. This was the case with the Jacky Nieuwstraten interview (shown in appendix 11.2.4), and the notes taken were used and extended upon straight after the interview had taken place, so the majority of information could be recalled and noted.

6.2 Data Analysis

The data analysis in this research project will involve a process of first organising and preparing the data for analysis, and then reading all data before the data is then coded by hand to collect themes that are apparent in the text. The development of codes, in this research, was based on emerging data from the

interviewees, rather than predetermined codes. Segments of the text are lifted and a word put in the margins to represent a theme identified. The themes are then grouped into broader categories by looking for commonalities between themes. Once this preparation is complete then it is possible to undertake the data analysis. In this research project, the analysis will use these themes and categories identified to create a storyline in the current state of sustainable mobility planning. (Creswell, 2014) The stories told by the planners will be analysed in light of these theories to critically look at potential problems and opportunities for sustainable mobility practice. A discussion follows the results and analysis section, in order to answer the main research question.

6.3 Validity and Reliability of Research

6.3.1 Researcher

A post-positivism approach has been used in this research, based on the assumption that values and background cannot be removed from the research process. Urban Planning research and practice cannot be approached as a positivist, as positivism denies the role power plays in science (Hughes and Sharrocks, 1997). Instead these values, bias and influences shape the research process, from picking the topic to the analysis. In line with this, the way the researcher chooses to frame and conceptualise the research is political in itself (Farthing, 2016). It can be argued that "all theory is […] normative, i.e. suffused with values and embedded within a social and historical context" (Allmendinger, 2009: 89). Flyvbjerg (2001) also notes the connection and inability to separate the researcher from the context of the research by stating, the "context both determines and is determined by the researchers' self-understanding" (p.33).

Farthing (2016) adds to this by arguing that a planning researcher will always have a view on the situations that are desirable, and that this will inevitably be a part of the research. This is apparent in the research project as urban planning research always takes place within the real world context. Transport planning had previously been focused on prioritising car-use, however there has been a shift towards planning policies that aim to create more dense and active cities. This is particularly the case in Denmark, where the researcher is exposed to this particular shift in planning, with sustainable development and liveability being an important goal in Nordic urban policy and promoted at the local municipal level (Jørgensen & Ærø, 2008). The choice of sustainable mobility as a topic already shows the importance that the planning researcher is placing on the issues of climate change, and sustainability. However, as opposed to the topic choice, the researcher attempts to reduce their influence in terms of data analysis by creating themes on the data collected, based on the data provided by six different municipal planners, adding to the validity as the knowledge came from multiple sources (Creswell, 2014).

6.3.2 Methods

The interview sample provides a valid representation of the targeted group, northern European municipal planners, with an influence in the field of mobility. As a range of planning roles and different countries are represented in the data collected, and the research question is framed to focus on municipal planning practice, making the interviews more reliable and valid in this context. However, it is understood that this is a section of the overall stakeholders involved in the mobility planning process, without the time restrictions of this project, it would be beneficial in future research in this field to explore the relationship between sustainable mobility planning and tactical urbanism in relation to a wider pool of stakeholders, for instance NGOs, private consultancy firms, and the public.

In terms of the validity of the interviews as a method, it was recognised that interviews are subject to inaccurate information sometimes being exchanged and that the method is subject to bias (Yin, 2003). This was taken into account when analysing the data, as the planners may all remember events differently and that results may differ greatly depending on the sample of interviewees. The interviewee's personal opinions and values relating to the topic of sustainable mobility will influence the answers given. However, this is the case with all methods involving interviews, and the ability to obtain personal stories from planners relating to the topic provided new knowledge regarding sustainable mobility practices.

6.3.3 Theories

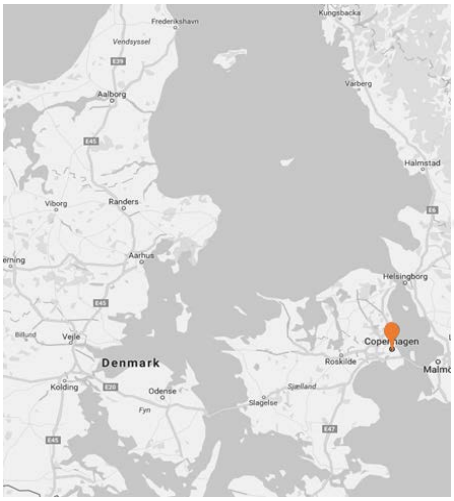
The theories were chosen after the process of interview collection, and were loosely based on the trends leading to a rise in tactical urbanism projects identified by Lydon & Garcia (2015), in order to provide the knowledge on theories that are prominent in creating a shift in planning practice towards a bottom-up, tactical approach to sustainable mobility planning. In addition to theories surrounding general urban planning trends, specific planning theory on the communicative turn in planning and deliberative planning practice provide an imperative theoretical basis on which tactical urbanism as a concept can be analysed within the municipal urban planning practice context.

7 RESULTS & ANALYSIS

7.1 PROFILE OF THE FIVE SELECTED EUROPEAN MUNICIPALITIES[6]

The following section details the brief profiles of the five selected municipalities that have been interviewed for this research project. The profiles illustrate how the municipalities are presently working with sustainable mobility, within different transport and energy departments. The current goals set and projects implemented in sustainable mobility planning, providing a picture of the diverse progress made across Northern European municipalities; in Denmark, Norway and the Netherlands. As well as the differing requirements of the selected municipalities regarding sustainable mobility planning.

Copenhagen Municipality



Municipal goal: CO2 neutral by 2025 (Søgaard, 2016)

Copenhagen, Denmark's capital located on the island of Sjælland, currently has a population size of 591,481 (Jan, 2016), with a relatively high population density of 6,702.3 inhabitants per km^2 covering an area of 88.25 km^2. As well as the overall vision to be CO2 neutral by 2025, the municipality has also set a short-term target for 2015 of reducing the overall emissions by 10%.

Copenhagen has claimed the title of the world's best bicycling city for a number of years and are often placed at the top of the world's most livable cities lists (Denmark, 2014). The municipality see bicycle planning as an important part of the city's livability title. As well as the municipal planners, Copenhagen's politicians also put bicycle planning high on the political agenda partly due to the status as a world leader in cycling infrastructure being used as a city branding tool. (Søgaard, 2016)

In addition to bicycle planning, Copenhagen have been at the forefront of implementing many sustainable mobility projects, however, the city aims to take their current progress even further and like most cities require further knowledge and decision-making tools for selecting sustainable mobility projects that should be implemented if they are to meet the ambitious municipal goal set.

[6] All population statistics from https://www.citypopulation.de/, which provides population statistics for Countries, Administrative Areas, Cities and Agglomerations.

Skive Municipality

Municipal goal: being CO2 neutral by 2029 (Nielsen, 2016)

Skive is located in the north-west of Denmark and has a current population of 46,540 (Jan, 2017). The municipality's population density is 67.4 inhabitants per km^2 over an area of 690.7 km^2. Skive has the lowest population density of all the cities interviewed, and therefore faces different challenges when it comes to introducing successful sustainable mobility initiatives.

Despite the ambitious municipal goal set by the planners, the municipality is in the preliminary stage of creating a sustainable mobility plan, which will be a focus for Skive municipality over the next few years. The physical implementation of sustainable urban mobility projects is also in the early stages for Skive, having implemented one project focused on dramatically increasing the use of biogas in public and privately owned vehicles in the municipality. Currently, the municipality converted all municipal vehicles to run on biogas, and are now working on strategies to encourage the use of biogas by the local citizens.

Aalborg Municipality

Mobility goal: to increase modal split within sustainable modes of transport (Mobility Strategy 2013-2025, Aalborg Kommune)

Aalborg is located in the Nordjylland region of Denmark. The municipality currently has a population of 211,937 (Jan, 2017), with a population density of 185.3 inhabitants per km2 over an area of 1,143 km2.

The urban areas in Aalborg municipality have a relatively high density of public transportation facilities and bicycle paths, leading to multiple mode choices for citizens. However, the city

still experiences high levels of congestion from private vehicles during commuting hours. At Aalborg municipality, both the department for transport and the urban planning department work together on mobility issues (Anderson, 2016), as sustainable mobility is affected by both transportation and land-use.

The city's mobility strategy perspective is focused on people, not traffic, and therefore seeing people as mobilists, who should make smart choices when using multiple transport modes (Aalborg Kommune, 2013). The municipality has attempted to influence the modal split in the urban areas, by improving biking infrastructure, footpaths and public transport systems (Anderson, 2016).

Stavanger Municipality

Municipal goal: zero growth in personal car mobility (Berg, 2016)

Stavanger is located in the South West of Norway and has a current population of 132,729 (Jan, 2017), with a population density of 1,948 inhabitants per km^2 over an area of 68.11 km^2.

Uniquely, Stavanger's business district is located on the city's outskirts, with a main purpose of the city centre being recreational, for shopping and other purposes. Stavanger is situated in a valley with the business districts and residential areas being located on flat ground around the city centre. (Børresen, 2016) Therefore, when mobility planning in the city has to consider these characteristics, and plan for a city where the majority of commuter journeys will take place outside of Stavanger's city centre.

During the interview, Børresen (2016) noted that Stavanger *"has been a car city so that is a barrier that has to be overcome"* when attempting to improve the sustainability of mobility in the city. Stavanger's urban mobility goal to reach zero growth in private car mobility is due to the overall reliance on private vehicles in the city and therefore the municipal planners seek to reverse the unsustainable trend. In order to reach the ambitious municipal goals, the planner's interviewed felt that more should be done if they are to meet their targets. Currently, they are revising the environmental plan for Stavanger to facilitate a shift towards zero growth in private car mobility. The municipality has implemented a number of solutions to facilitate this shift, including physical bicycle infrastructure improvements, and campaigns to promote behavioural change for the citizens.

Amersfoort Municipality

Mobility goal: No quantifiable goal, however it is a key concept driving both the climate and mobility plans. (Nieuwstraten, 2016)

Amersfoort is located in the province of Utrecht, the Netherlands. The municipality currently has a population of 154,338 (Jan, 2017), with a population density of 2,455 inhabitants per km2 over an area of 62.86 km2.

Although the city of Amersfoort does not have a specific quantifiable goal for urban mobility, they seek to keep a main focus on the continued take-up of cycling in the city, with an interest in increasing connections between the city centre and surrounding areas. As is the case with many cities across the Netherlands, Jacky Nieuwstraten notes that the concept of sustainable mobility is engrained in planning practice. (Nieuwstraten, 2016)

Consequently, Amersfoort has implemented a range of sustainable mobility measures across the urban areas. In addition to this, the municipality is now focusing on ways to make the city smarter when it comes to urban mobility, in order to take advantage of the new technologies available to make planning for mobility more efficient and to encourage modal shifts away from private car use.

(All maps adapted from: https://www.google.dk/maps/place/)

7.2 WHAT ARE THE CURRENT BARRIERS TO IMPLEMENTING SUSTAINABLE MOBILITY PROJECTS AT A EUROPEAN MUNICIPAL LEVEL?

This sub-question aims to highlight the current barriers faced by the six municipal planners interviewed across three Northern European countries, in terms of implementing sustainable mobility projects at a municipal level. Knowledge of current barriers of sustainable mobility allow for understanding what issues are present in municipal planners, to then explore how planners in practice are introducing tactical urbanism characteristics into planning practice, in order to attempt to overcome some of the current barriers. Some of the barriers found also appear in Banister's (2005) list of barriers, however further barriers have been highlighted below specifically related to barriers faced at the five municipalities. The barriers identified are presented at three different levels: political, planning practice, and citizen.

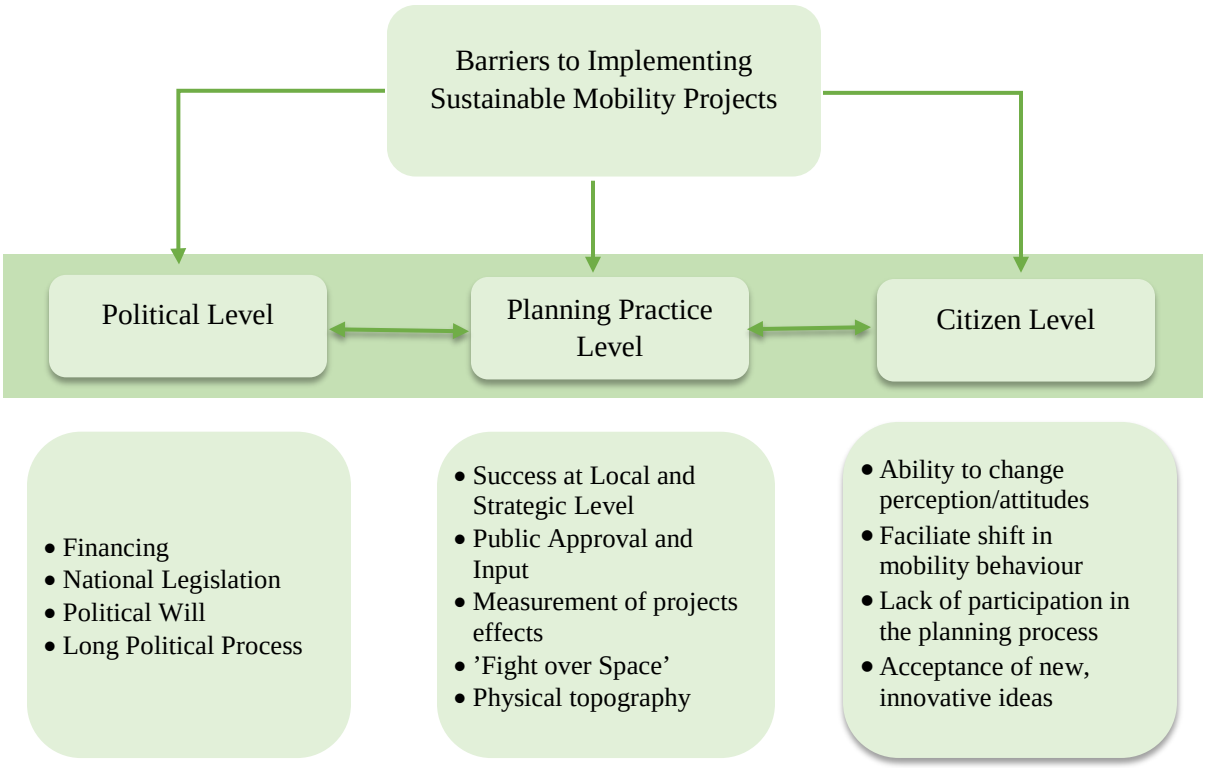


Figure 6: Identified Barriers to Implementing Sustainable Mobility Projects at a Municipal Level

7.2.1 At the Political Level

The shift towards more sustainable mobility practices at a municipal level can be seen as an important political tool. Having more opportunities for sustainable mobility in a city is a crucial part of a city's image as a green, liveable city. It is a powerful tool for sustaining a city's image, as is the case with Copenhagen, or as a way to create a brand for a city to encourage further migration and tourism to the city, as is the case with Skive. Jacky at Amersfoort Municipality also notes the potential of sustainable

mobility being a branding tool for her city, in order to make the public even more aware of both sustainable mobility as a concept and how the planners' are currently implementing related projects in the city.

Based on the interviews with municipal planners', I would argue that political will and consequent funding are crucial to the shift towards greater sustainable mobility projects that are implemented in the local urban context. There is an apparent gap between what projects the planners may want to implement in order to achieve the liveability and environmental goals they have set, and the political opinion. The politicians generally want to back policies and projects that are popular with the general public. Søgaard (2016) uses the example that policies and projects that restrict car traffic are politically unpopular, and therefore even though they will help to achieve the political vision of a liveable, green city it is often hard to receive backing.

Helene Søgaard (2016) highlights that having a sustainable political vision for the City of Copenhagen is relatively easy, having the political will to follow through with projects that will lead to reaching the vision is harder to accomplish. She noted that the planning of sustainable mobility projects is a extremely political process, in which the projects that a relevant in furthering the particular political agenda will be much easier to implement, as they will get political backing and therefore the required funding. Jeppe Andersen from Aalborg Municipality (2016) explains how they have experienced trying to implement sustainable mobility measures that they haven't been able to move forward with due to not receiving support from all political parties. He uses the example of wanting harder restrictions for car use on Vesterbro but coming across political barriers stopping the ability to move forward with this project. In this case, it shows clearly where planners' feel that a project would be beneficial in reaching environmental and social goals but the lack of full political support presents a barrier.

The political will is related to the politicians that are currently in power at the time and the level of importance those politicians put on promoting sustainable mobility in the city. Therefore, the ability for planners to implement certain projects is subject to change depending on the political cycle and can change drastically in within a few years (generally four years). In Copenhagen, Søgaard (2016) recalled that when Klaus Bondam was the environmental mayor and Ritt Bjerregaard was Lord Mayor between 2006 and 2010, there was a very progressive political backing for bicycle infrastructure, as they saw Copenhagen's position as one of the world's best cities for cycling as important for branding the city on an international platform. In turn, Copenhagen planners have been able to implement ambitious projects in bicycle planning due to political backing and funding. Neilsen (2016) noted that *"if we take small steps all the time we can get to the goal in the end"*, pointing towards a need for incremental planning practices

in order to mitigate the effects changing political situations have on the planners ability to implement sustainable mobility projects.

Relating to political will directly is the financial backing that politicians' are willing to put into certain projects, and this can have a major effect on which projects planners' are able to pursue. In addition, the a long political process can be involved in sustainable mobility planning, for example Søgaard (2016) highlights removing parking from city centres as a project that is very difficult to implement due to many considerations and the potential negative reactions from the general public.

Political influence on sustainable mobility planning can be related to formal and governance institutions that can present a barrier to shifting mobility practices. Formal institutions, including laws, regulations, and high level orders, can present a barrier and tend to be stable over long periods of time (decades) (Rietveld & Stough, 2005). Søgaard (2016) highlighted this during the interview noting that *"the frame for what the municipality can do really, […] is shaped by the National legislation"* and therefore these formal institutions have a great influence on what is possible and how far a planner can go in terms of innovative changes to mobility practices. In addition Teresa from Skive Municipality notes the barrier faced when it comes to older laws that have not caught up with the advances in greener transport. They experienced this barrier when implementing a project to increase the use of biogas in the municipal fleet, where older laws created a big barrier. Governance institutions can also present a barrier, however changes in these institutions occur at a greater frequency (years), and involve rules that change or maintain regulations or policy directives (Rietveld & Stough, 2005). Thus, planners' will be more influenced by the city mayors and advisors in that particular urban context, rather than on a national level.

7.2.2 At the Urban Planning Practice Level

At the urban planning practice level, both the influence from the political and citizen level are vital. The municipal planners' have to consider both these influences and propose sustainable mobility projects that are beneficial within the given urban context.

When planning for the implementation of sustainable mobility projects, the planners' interviewed highlighted a number of barriers that were present at the planning practice level. The first being how the planners' can attempt to make drastic changes to a city's image. Røar Børresen from Stavanger Municipality (2016) expresses that *"being seen as a car city is a barrier that has to be overcome"*, seeing the past image of the city as a barrier to overcome as the 'car city' can be seen as the antithesis of a city with a multitude of sustainable mobility options available to the citizens. Therefore, in order to change the city's image of being a 'car city', changes have to be made to the transportation system, and the built environment in order to facilitate a shift towards more sustainable mobility practices. These required

major changes can present a substantial barrier in creating a shift towards more sustainable mobility practice, as it involves both physical infrastructural changes and also drastic changes to citizen behaviour.

In addition, physical space is also a barrier in planning for sustainable mobility due to the need at a planning practice level to balance the use of limited space. Søgaard (2016) adds that:

"The fight over space is dominant. You need green areas, you need road space, you need bicycle space, you need a public space, public transport space, you need buildings, everything."

Therefore, the planner is in a position where they have to manage the requirements from many groups, from politicians to businesses to the general public. It presents a barrier for planners' to implement sustainable mobility measures if they are presented with limited space to facilitate sustainable modes of transport. This is a dilemma that was also faced by Aalborg municipality, who wanted to make one car lane going in each direction into bus lanes and thought it would be beneficial to promote sustainable mobility in the city (Andersen, 2016). However, the 'fight for space' became an apparent and the project didn't receive the political backing. In my opinion, this demonstrates that the politicians' still prioritise the private car user and do not believe that there is the ability to move people out of private vehicles and to more sustainable modes. Hence, prioritising public transport would present negative consequences in this context. However, the planners' seem to have opposing positions, following the sustainable mobility's prioritisation of modes, where pedestrians are seen as the most important road user, followed by bicycles and public transport and then private vehicles being the group who should be considered finally.

Jacky Nieuwstraten (2016) at Amersfoort Municipality noted that one of the main barriers she faces when attempting to implement sustainable mobility projects at a local level is public approval and input. Furthermore, Teresa Nielsen at Skive Municipality also states the importance of creating a persuasive argument that will make the public look positively towards changes to mobility in the urban area. In the case of introducing biogas to the citizens of Skive, the planners' at the municipality are publicising the use of biogas in the municipal fleet, in order to raise the public awareness and slowly encourage the use of alternative fuels in private vehicles. There is awareness that the public need positive examples of a sustainable mobility alternative, especially if it is a new, innovative idea, before they are expected to use it as well. It involves providing the public with pull options rather than push when it comes to potentially controversial projects.

Another barrier affecting the planning practice level is the need for planners to consider projects in terms of their strategic, neighbourhood and street level impacts. Nielsen (2016) notes that:

"To plan for an area you look at it on a higher level and then you implement new measures on a lower level and then you come to the building level and you have to make a mobility plan also to make sure that you are fitting the requirements on a higher level plans."

This shows that the planner has to manage the potential impacts of a project at varying scales, in order for it to work on the small scale within a particular neighbourhood all the way down to the individual street. Implementing projects at the street level allow for projects to be tested in a small scale, however, it is complex but important to consider whether a project is assisting in reaching goals set at a strategic level. Furthermore, problems can arise when attempting to assess the success of a singular project as the combination of sustainable mobility initiatives can change the expected results. Nieuwstraten (2016) builds on this by stating that mobility planning has to make sense in a local context.

Creating a shift in planning towards sustainable mobility practices is complex and Helene Søgaard (2016) states *"there is a difference between having a political vision and then taking the specific concrete steps forward"*. I argue that this opinion demonstrates that there is still a theory-practice gap between the desired outcome and theoretical knowledge on the benefits of sustainable mobility, and how physical sustainable mobility projects are being implemented (Homrighausen &Tan, 2016). Furthermore, the shift requires that different departments work together for the successful implementation of projects that consider all the aspects of planning that effect sustainable mobility, for example the important co-ordination of the transportation department and the urban planning department when considering mobility practices. The planners interviewed at the five municipalities all worked within different types of organisation framework. At Copenhagen municipality, there is a designated mobility department, which is seen in a number of cities with advanced development in the area of sustainable mobility planning. However, the planners at Aalborg Municipality, Amersfoort Municipality, Stavanger Municipality and Skive Municipality, have to work across departments. This can be a potential positive aspect as it can produce innovative ideas across disciplines, however it can also cause barriers to progressing in sustainable mobility planning if the municipality lacks the resources to put towards planning with multiple departments involved.

In Banister's (2005) list of barriers to sustainable transport, the physical barrier of the city's topography was stated. This appeared as a barrier in the interviews, particularly in the case of Stavanger. Stavanger is an urban area where the city is in a valley, with the city centre in the centre and the business and residential areas elevated around the centre. Therefore, the hills present an obstacle when planning for increased cycling use. The city has been attempting to mitigate this problem by introducing electric bike sharing in the city, which has been successful. However, the physical topography will always have to be considered and could present barriers for implementing specific sustainable mobility projects in the

future. Cities like Stavanger will always struggle to get to the advanced level of bicycle planning that is experienced in cities, like Copenhagen and Amersfoort.

In addition to the physical landscape, the built environment can present a barrier to implementing sustainable mobility projects. For example, Skive municipal planners' face a barrier of planning for a less densely populated urban area. Therefore, mobility projects that may work in larger Danish cities, like Copenhagen and Aalborg, are not suited to Skive's built environment. The potential for increased bicycle infrastructure is not practical and instead the planners' are focusing on how to make car travel more sustainable, either through car sharing or using environmentally friendly fuel options such as Biogas. These limits present a potential barrier as the city attempts to shift towards more sustainable mobility practices.

7.2.3 At the Citizen Level

The involvement of citizens in the planning process for sustainable mobility projects, in addition to the way the public respond to the implemented projects, plays a crucial role in the success of the sustainable mobility projects and how the citizens view the shift in mobility practices.

Banister (2005) notes the complex relationship between policy-making in sustainable transport and citizens behavioural responses, with a policy-behaviour gap being apparent both due to the choices available to impact individuals' behaviour and also a negative response by the citizens being sometimes attributed to poor implementation of the projects. Increased citizen involvement in the planning process at all stages and pilot projects aim to reduce this policy-behaviour gap by identifying issues and potential improvements before full implementation of projects on a large scale.

In terms of barriers at the citizen level, this can be seen in different ways. The crucial separation is between the barriers of citizen involvement in the planning process and behavioural responses to projects that are already implemented. Although this is looking at citizens in two different capacities, the two can be linked as citizens that have taken an active role in the planning process are often more likely to approve and change their behaviour, either due to approval or greater awareness of the project. Both ways can be seen as increasing citizens 'right to the city', allowing citizens', as Lefebvre suggests, to access and be influential in the decision making process and have the right to use space once the project is implemented. As Purcell (2013) argues the emphasis should be on the user of urban space, therefore the citizens are crucial stakeholders in planning and should be incorporated into the planning process. However, in what capacity they should be involved to lead to successful implementation is contested.

Municipal planner Teresa Nielsen (2016) saw the advantages of involving businesses and public stakeholders in the planning process. Nielsen notes that having this involvement by a wide range of actors

provides new perspectives and innovative ideas. Nieuwstraten (2016) adds that at Amersfoort Municipality, both the public and corporations need to be involved in the planning process as it cannot just be planners working on their own. Amersfoort sees that there is a dependence on public approval and therefore it has to be considered if a project is to be successful. However, even though involving multiple stakeholders is vital, it is also difficult to develop a democratic planning process in which multiple stakeholders are fully integrated into the decision-making. The ability for the planners to facilitate a planning process where public input is considered is therefore a barrier if the municipalities are unable to have a planning process that can involve a wide range of citizens. Homrighausen & Tan (2016) further highlight in their research, the importance of creating networks between actors that will facilitate the sharing of innovative ideas. This is in line with Nielsen's thoughts as he hopes for greater information sharing between departments at the municipality and with businesses and citizens.

Skive municipality are in the early stages of planning for sustainable mobility and are choosing to 'lead by example'. Providing the public with information on the sustainable projects being undertaken and being the first ones to change their own behaviour to encourage behavioural change for all citizens. Nielsen (2016) states that:

"People have to see this as an opportunity to get Skive to be smarter […] we have to create a persuasive argument, so that the public want this as well" (Nielsen, 2016)

This highlights the emphasis the municipality is putting on public approval in regards to how successful the project will be. Therefore they are providing 'pull' strategies, as opposed to 'push' strategies that may be more unpopular with citizens and politicians. Nielsen wants to implement projects that have directly promote awareness of sustainable mobility, this is mirrored by Nieuwstraten who wants to use sustainable mobility as a branding tool for the city and make the public even more aware of how citizens can shift to more sustainable mobility practices. However, as with Skive Municipality, Amersfoort also has to approach this while understanding that it could be a potential barrier to implementing a successful project if the way citizens are involved in the planning process and strategies for behavioural change is not constantly considered by the planners.

To conclude, the interviews provided knowledge on the current barriers that are facing municipal planners when it comes to planning for the implementation of sustainable mobility projects. Barriers were discovered at three main levels: the political, the planning practice, and the citizen. These identified barriers allow for understanding of why tactical urbanism approaches in formal planning practice could be required, to further the implementation of sustainable mobility projects to help the progression in the paradigm shift towards sustainable practices. The benefits that have been equated to tactical urbanism in

literature, including the ability to test projects in the short term with the emphasis on informing long-term implementation, promoting citizen engagement in the evaluation of projects and optimising funding opportunities (Mitman & Rixley, 2015), can lead to tactical urbanism being seen as a potential approach to overcoming many of the barriers discussed above.

7.3 How are tactical urbanism approaches currently being used in the implementation of sustainable mobility projects?

Tactical urbanism should be discussed in terms of its characteristics, benefits and the reasons for its popularity in urban planning practice. Tactical urbanism began of a response to the perceived failings of inflexible formal planning practice at a municipal level. However, with the increasing trends in urban planning that have led to the popularity of tactical urbanism approaches, these approaches are being integrated into formal planning practice, and are likely to be used to a greater extent in planning practice in the future.

Tactical urbanism is defined in this project as:

"An approach to neighbourhood building that uses short-term, low-cost, and scalable interventions and policies to catalyze long term change". (Lydon & Garcia, 2015, p.2)

Not only are the trends happening in urban planning of economic recession, renewed love affair with the city, citizen frustration and radical connectivity (Lydon & Garcia, 2015) effecting the increased use of these approaches in formal planning practice, the municipal planners are also seeing the benefits of using tactical urbanism approaches in planning practice.

When attempting to overcome some of the barriers presented in section 7.2, the municipal planners interviewed provided stories surrounding sustainable mobility projects that have been implemented. The clear similarities between the projects discussed was the tactical nature of the new projects and the benefits this form of planning presented planners' with when attempting to introduce new sustainable mobility ideas to the public and politicians.

The incremental nature of planning practice was highlighted by a number of the municipal planners, with Nielsen (2016) from Skive municipality noting the importance of an incremental approach, stating *"if we take it in small steps all the time we can get to the goal in the end"*. Showing that in Skive the planners feel that small-scale projects can be seen as a way to achieve the environmental, economic and social visions they have for the city. This is in line with tactical urbanism, as not only are large-scale permanent interventions in the urban context seen as the only solution. Instead smaller, scalable projects are a way to achieve substantial long-term change to the urban area.

In addition, Andersen (2016) from Aalborg municipality, notes that they use the method of having "*some smaller pilot projects then see what are the effects of this is and then require the approval off the police to roll the initiative out"*. This highlights the experimental nature that can be attributed to sustainable mobility planning when appropriate. Andersen (2016) sees the advantages of projects providing a test scenario, in which the realistic impact can be evaluated. It can provide information on how a measure will react in the complex transportation system, with the ability to see if "an initiative that will promote more sustainable transport modes at the cost of non-sustainable modes" (Andersen, 2016). This is more important to the planners than preliminary estimations on precise impacts, such as emissions reduction, as this cannot be completely accurate until measured in a test scenario.

Berg (2016) adds that *"it's kind of innovation in every project so you don't always get a background of whether this is a good or bad idea"*. This relates to the tactical urbanism characteristic of testing projects in real-life urban contexts, which is especially important in sustainable mobility projects due to the unpredictable, complex nature of the transport system and the relatively new project concepts that need to be tested to understand the implications on the urban area.

Three examples of municipal sustainable mobility projects have been selected from the interviews that demonstrate how tactical urbanism approaches are currently being used to facilitate the implementation of sustainable mobility projects.

Figure 7: Biogas Municipal Vehicles, Skive (EC, 2015)

The first project has been implemented by Skive municipality, and is attempting to encourage the use of biogas in private vehicles across the city. The city's built environment is not dense and therefore distances to travel are too long for walking and cycling to be viable option for most people. Therefore, the municipality is encouraging the use of biogas in private vehicles; however, a large-scale rollout of this initiative would not be possible, as it requires people to change their vehicles. Instead, this is a small-scale project with the objective of raising awareness around the use of biogas, with the aim of encouraging long-term implementation. Presently, the project has approximately 40 municipal vehicles that use biogas and the planners drive these vehicles around that have large commercials showing how the municipality is encouraging the use of green energy.

Stavanger has implemented two projects that could be defined as tactical. The first being Norway's first bike priority street, which is 800m long, and involves painting the whole street red with bike symbols on the ground. This project is a way to test a project that encourages cycling on one street to start, and then implement the project in other parts of the city if successful.

It is logical that the planners' have used tactical approaches in bicycle planning, as projects surrounding promoting cycling have held a significant role in tactical urbanism worldwide, especially when looking at citizen frustration that has led to unsanctioned bike lanes being painted. This is a major issue for urban planners, as unsanctioned changes to the road space can lead to adverse effects, like increased congestion, as the citizens who implement the bike lanes often lack the knowledge the transportation system and can lead to a number of safety issues for all modes, particularly vulnerable road users (cyclists and pedestrians). However, when planners are able to harness the same tactical ideas within formal, sanctioned planning then the advantages of tactical urbanism, including low cost and incremental, can be used to progress with the implementation of sustainable mobility projects, whilst being able to control the safety aspects of bicycle planning.

Figure 8: Construction of Bicycle Priority Street, Stavanger (Stavanger Aftenblad, 2016)

Figure 9: 800m Bicycle Priority Street, Stavanger (Stavanger Aftenblad, 2016)

Figure 10: Bike Priority Street in Stavanger, illustration by Stavanger Kommune (Stavanger Aftenblad, 2016)

In the case of Stavanger, both Berg and Børresen (2016) describe the current emphasis being put on improving the infrastructure for bikes in the city, with Berg working on the overall strategic plan for mobility and Børresen focusing specifically on bicycle planning. Børresen's role has only recently been created as part of the existing parks and roads, which has now become the park, roads and bicycle department. Børresen notes that "*earlier biking was seen as only a project and now it is a section in itself*", showing the growing interest

in developing this sustainable mode of transport. This development in the municipality's organisation is interesting due to Børresen's role being focused on facilitating the implementation of bicycle projects at the street-level. Having this street-level perspective has meant that more awareness has been raised with the public that these projects are being implemented, as Børresen has been able to promote the projects on the street. He has also been influential in promoting the provision of 'soft measures' in sustainable mobility planning as well as the 'hard ones', like large-scale bicycle infrastructure (Berg, 2016).

The tactical nature of the bike priority street allowed for reduced barriers for implementation, as low costs and small-scale allows for fewer barriers at the political and planning practice levels. Berg added that politicians attended the opening of the street and "were very eager to promote what we do and have just decided to put even more money into bicycle infrastructure". This shows the ability for small-scale projects, when implemented in a real urban context, to provide positive examples that promote planning for sustainable modes. In the case of Stavanger, being able to show politicians first-hand the impact of one small-scale project has led to increased funding for bicycle planning.

Figure 11: Stavanger Electric City Bikes (Roushar, 2015)

The second example of a tactical approach to sustainable mobility planning is the introduction of a bike share scheme. Bike-shares are large-scale tactical urbanism projects that have proven extremely popular across Europe. Bike-shares can be classified as tactical urbanism projects because it is a temporary solution that can be used to promote and raise awareness of cycling across the city (Marshall et al., 2015). In the case of Stavanger, cycling has a number of barriers most noticeably the physical topography as the city centre is surrounded by hills, so coming to and from the city is more difficult by bicycle. Therefore, Stavanger municipality looked for international example projects where electric bicycles had been used in bike-share schemes. Børresen (2016) stated that they "went to Copenhagen and saw how the bike space looked, so decided to do it as a pilot project".

In the case of both projects, the bike Priority Street and electric bike-share scheme have a component of international influence on the selection of projects. With the bicycle project being inspired by a similar street in Holland and the electric bicycles used in the bike-sharing scheme was inspired by Copenhagen's gold bike. The planners did site visits in both examples to understand how the project had already been implemented in a European urban context. It can be argued that this removes some uncertainty in the

planning process and can be used to encourage politicians and planners to implement tactical urbanism projects that encourage the use of sustainable modes of transport.

Berg (2016) notes that the *"size of the cities make thing possible"* This can be seen as a barrier due to uncertainty in potential results of projects. However, implementing projects on a smaller scale allows for testing the effectiveness in a specific urban context. In municipal planning practice;

"you don't always have the time to broaden up before you focus down and there are different types of databases that you can use […] which in a way is very good with best practice cases"

Therefore, the use of EU websites, including CIVITAS, can be very useful to planners' when selecting new, innovative small-scale sustainable mobility projects. This can be connected to one of the trends leading to a rise in tactical urbanism of radical connectivity, and can provide a multitude of opportunities to promote the use of tactical urbanism approaches. All the municipalities interviewed noted some level of influence from best practice examples throughout Europe and the world. Christin Berg at Stavanger Municipality explained how the bike priority street was influenced by a project in the Netherlands, and by implementing it in Stavanger has led other Norwegian municipalities to follow and implement similar projects. Copenhagen and Aalborg planners' have also been engaged with many EU projects, which allows for large levels of knowledge and information sharing across Europe. In turn creating an international network of municipalities, and organisations working within the transport sector that can share experiences.

In conclusion, the three projects highlighted from the interviews with municipal planners at Stavanger and Skive municipalities provide an insight into the types of projects that municipal planners are currently implementing. I argue that the three projects shown have tactical characteristics, with both temporary and scalable aspects playing a vital role in the projects. Stavanger municipality are showing how bicycle planning is being encouraged through tactical approaches. Despite the planners not using the term tactical in association with the projects, the scalable factor plays a significant role in projects within bicycle planning as the city is introducing small-scale projects with the expectation of expanding to other parts of the city once tested. In turn, incrementally increasing the conditions in the city for cyclists. The two bicycle projects highlight the important role these projects are having on reducing political and citizen level barriers once implemented, as politicians are seeing the benefits in branding the city as being progressive in sustainable mobility and citizens are able to experience the projects on a small-scale, so that the are more aware of the benefits before an expansion of the project at a later date. All three projects are also characterised by temporality, with the Stavanger's two bicycle projects and Skive's biogas project providing solutions to mobility issues without making large-scale infrastructure developments or

changes. This allows for adaptability, which is crucial due to the uncertainty that characterises the implementation of new mobility projects, in terms of economic, social and environmental outcomes.

8 'TACTICAL SUSTAINABLE MOBILITY': WHAT ARE THE OPPORTUNITIES AND CHALLENGES OF USING TACTICAL APPROACHES TO ADVANCE THE IMPLEMENTATION OF SUSTAINABLE MOBILITY PROJECTS?

The following question is split into two sections, with the first part reviewing how planners at the interviewed municipalities are currently incorporating tactical approaches into formal planning practice to progress with the implementation of sustainable mobility practices, in spite of the present barriers to implementation. Followed by a discussion of the opportunities and challenges of tactical approaches being incorporated into planning practice at a municipal level.

In this research project, 'tactical sustainable mobility' has been defined in terms of its characteristics, temporary and scalable. To be described as tactical, a project can be both temporary and scalable or be characterised by one of the two. Temporary and scalable approaches, in this research, are defined as:

Temporary

Tactical sustainable mobility can be characterised as temporary due to a shift from permanent responses to urban issues towards temporary uses of urban space. Temporary is used in this research to describe the short-term, interim, transitory nature of the sustainable mobility projects discussed. The temporary characteristic allows planners to be more responsive to the demands and needs of citizens (Nemeth and Langhorst, 2014), allowing for more flexibility in planning for urban areas when the social, environmental and economic effects of projects are uncertain. Berg (2016) from Stavanger municipality notes that innovation is apparent in every sustainable mobility project, so the results will be uncertain. Therefore the ability for a project to be temporary provides the ability for new innovations to be tested.

Scalable

Scalable is the second characteristic associated with tactical sustainable mobility. This characteristic allows projects to be implemented on a small-scale will the aim to expand the project into other parts of the city, once successful in one area. As is the case with the temporary aspect of tactical projects, being scalable provides planners with the possibility to test sustainable mobility projects on a smaller budget. Planning in this incremental way provides many of the municipalities interviewed with more efficient planning processes, with Nielsen from Skive municipality noting that taking smaller steps will allow for the planners to reach overall goals set in the end. In addition, the Climate-KIC mobility seminar allowed the planner from Aarhus municipality to express the goal of shifting towards sustainable mobility will be reached by planning 'little by little'. Municipalities often implement these small-scale pilot projects, in

order to provide a test scenario so that the real impacts can be evaluated, due to the unpredictability of new projects.

The interviews with the five municipalities illustrated that at a local municipal level there are a number of barriers present (section 7.2) that are hindering the implementation of sustainable mobility projects, however by using the characteristics of tactical urbanism in sustainable mobility planning at a municipal level, planners are being able to move forward with mobility projects that foster more sustainable mobility practices. This research project argues that municipalities are currently overcoming a number of these barriers by using tactical approaches to sustainable mobility planning, with the characteristics of being temporary and/or scalable.

Using tactical approaches to overcome current barriers

The barriers at a political level are seen as crucial to planners due to the large amount of political influence on municipal planning. The planners interviewed highlighted the politicians' aspiration to have the desirable outcomes produced by increasing sustainable mobility in a city, and to achieve the political vision of a liveable, green city. Yet at the same time either not having excess to funding, or the desire to fund new innovative projects in the field. I argue that despite the overwhelming positive response by European municipal politicians to increase the liveability of their cities, due to the advantages that this creates, the ability to see that a particular project will have the desired effect is more difficult. The early stage of implementing physical sustainable mobility projects means that the effects to the urban environment is unknown before implementation, therefore politicians are more uncertain about putting forward large levels of funding. Other factors, including economic recession and individual politicians views on the importance of environmental issues, play a part in receiving funding and acceptance. For example, Copenhagen had a very progressive mayor from 2006 to 2010, and therefore the focus on implementing bicycle projects left a large impact on sustainable mobility in the city.

In order to overcome the political barriers of sustainable mobility, tactical characteristics can provide tools to push forward implementation of projects, despite the current political situations in different cities. The bicycle priority road in Stavanger has proved that physical implementation of projects, even on a small-scale, can have a large impact on public and political opinion surrounding sustainable mobility. Even a project of this size created a great level of awareness in the city of the importance of sustainable mobility and had the powerful impact of being able to physically illustrate to the politicians what improvements can be made to the bicycle infrastructure with relatively limited resources. The success of the project in this case also led to politicians wanting to promote bicycle planning even more and invest further funding into similar projects. This is in line with Lydon et al. (2012) opinion that tactical projects can be used as a step to receiving large-scale investment once a project has been test on a small-scale

street level. In addition, I argue that Børresen's newly created position within the parks, roads and bicycle department showcases the tactical nature of his job. Whilst Berg works on a more strategic level, Børresen's role is uniquely focused on the physical implementation of projects and therefore pushing forward bicycle projects at the street-level. Børresen's role is dependant on his ability to raise awareness and inform politicians and citizens about the benefits of bicycle planning, and therefore the success of this more tactical planning role is reliant on the drive and enthusiasm of the planner themselves. He has demonstrated that bicycle planning involves more than just the large-scale infrastructure projects and is also reliant on more 'soft' measures in order to create a shift towards more sustainable mobility in Stavanger.

At the planning practice level a number of barriers to implementation exist with sustainable mobility, including the city's image, 'fight over space', and having to plan on both the street level and at a higher, strategic level. If a city currently has an image of car dependency, whereby the majority of citizens feel private vehicles are the main way to travel around the city, it can be difficult for planners to reverse this mindset and offer alternatives to this car dependency. In a number of cities where planners were interviewed, the built environment and physical topography were part of the reason for car dependency, for instance in Stavanger the hills around the city centre presented a barrier to developing the bicycle infrastructure in the city, and in Skive the less dense built environment meant that biking and walking are not practical forms of transport. Therefore planners in these cities alternative tactical mobility projects are being used to promote sustainable modes. In this case, temporary and scalable projects allow for planners to use innovative new ideas to deal with mobility issues, as tactical sustainable mobility projects that are temporary and scalable mean that projects can be implemented with smaller funding opportunities and with uncertainty around the potential effects of mobility projects in the local context. The planners interviewed preferred to implement these projects on a small-scale and sometimes temporarily in order to test the effects in a real urban context once a project is implemented in a specific built environment, and is working in combination with other mobility projects.

Additionally, planners in practice face the barrier of limited space in the built environment, thus leading to a 'fight over space'. As Søgaard (2016) from Copenhagen Municipality notes, the planner must manage the requirements from multiple stakeholders in the urban areas and take into account the need for road, bicycle, public transport space, as well as public space and green space. In this case, the ability for planners to test mobility projects in real urban contexts through temporary or scalable projects allows for projects to be tested in relation to other aspects of the built environment, for example how a bicycle project would effect the other mobility options in the city with constricted space. Understanding how a project will influence the overall mobility in a city, as well as other social, economic and environmental

factors, also relates to the barrier of balancing a project on the strategic, neighbourhood and street level. The temporary and scalable nature of tactical sustainable mobility projects, can allow more extreme projects to be implemented and tested in the short-term and at a small-scale. This was the case with the bicycle priority road in Stavanger, where the 'fight over space' was taken to the extreme by removing all other modes of transport apart from the bicycle and walking from an 800m road in the city centre. A project with this level of restrictions would face many barriers from a number of stakeholders if it had been implemented to a greater degree across the city. However, by implementing a small-scale project the planners are allowing citizens, politicians and other stakeholders to assess the impacts of this type of project before the project is expanded into different parts of the city.

Lastly, the way in which citizens respond to mobility projects is crucial to the project's success, and therefore can present a barrier when the success is based on uncertain citizen behaviour. The characteristics of temporary and scalable, which don't on their own lead to successful implementation of sustainable mobility projects. However, tactical sustainable mobility projects do allow for citizens to experience a project in the short-term to increase awareness and receive feedback on a project, so that it can be adapted or expanded, depending on results. Implementing projects in this way also allows for planners to change the way citizens are involved, presenting a number of further ways citizens can be part of the decision making process and at the implementation stage. Therefore, providing a viewpoint within planning practice whereby emphasis is on the user of urban space (Purcell, 2013). A number of the planners interviewed, for example Nieuwstraten at Amersfoort Municipality, highlighted that the success of projects are very dependent on public approval and thus need to be considered actively throughout the decision-making and implementation processes. Although further research is required to understand the precise role citizens played in the projects planning process, it was clear in the case of Stavanger that having citizens and politicians present at the implementation stage allowed the municipality to create a great level of awareness around the bicycle priority project, which not only highlights safety aspects of the project but also increases the likelihood that citizens will use the new bicycle priority road. In addition, Skive municipality's biogas project shows how the planners are trying to influence citizen behaviour by raising awareness of mobility possibilities in alternative fuel vehicles. This is a small-scale project that is aiming to promote mobility behavioural changes in the long term.

Opportunities and challenges of 'tactical sustainable mobility'

In addition to currently assisting planners with overcoming a number of barriers that exist when implementing sustainable mobility projects, there are a number of potential opportunities that are created by implementing 'tactical sustainable mobility' projects. Firstly, the need for planners to be responsive to changes and trends in urban planning is critical. The global trends that Lydon & Garcia (2015) note

requires that planners change the way they are looking at sustainable mobility projects. The reduced funding from the economic recession means that planners have to look for alternative ways to get projects off the ground, which the tactical characteristics of temporary and scalable provide by allowing small-scale or short-term projects to provide a basis for changes to a cities mobility patterns. The citizen frustration can be seen as stemming from a lack of responsiveness in urban planning due to structured and formal planning system.

A further urban planning trend is radical connectivity (Lydon & Garcia, 2015), in which both planners and citizens have increased access to technology and the increase use of the Internet in planning processes. All the planners interviewed stressed the growing importance of sharing information within networks of planners and mobility experts, with all three of the projects mentioned in this research illustrating how other cities were used as inspiration for tactical sustainable mobility projects. For example, the two projects from Stavanger municipality mentioned took inspiration from the Netherlands and Denmark, with site visits being undertaken to understand how these tactical projects have worked in another urban setting. Not only does this provide planners with reassurance that positive results can be seen from these projects but also can be used of a political tool to illustrate the potential results. In addition, the planners were using sites, like CIVITAS, to access many small-scale projects that have been tested in other cities and the results of those projects, which encourages planners to implement similar projects when they understand how other cities have done it and the results experienced. This sharing of knowledge also helps planners with problem solving; for example, the case of the electronic bicycle share scheme was discovered in another city and allowed the planners at Stavanger to overcome the topography barriers of the hilly landscape through innovation.

Innovation within planning practice is actively encouraged through tactical urbanism, providing planners with the opportunity to test innovative ideas, with reduced risks involved. Fischler (2012) noted that in order to plan for innovation the uncertainty and non-rationality that dictates planning processes has to be considered. In order to implement new sustainable mobility projects there has to be a degree of innovation and therefore require that the planning process is adaptable to uncertain consequences that arise. In this case, tactical sustainable mobility projects can provide a framework in which innovation is encouraged and made possible. Marshall et al. (2015) highlight how tactical projects can reduce the knowledge controversies of stakeholders and allow for innovative projects to be implemented that can shift mobility practices in a city. The uncertainty that defines sustainable mobility planning also requires that planners have the ability to 'learn in action' and be able to reflect on what they are doing in planning practice if they want to push boundaries within mobility planning (Fischler, 2012) and adapt the innovative projects to react to the uncertain urban context. Tactical approaches therefore allow an informal learning process,

in which further understanding of how specific projects impact both the built environment and different communities can be discovered. The planner's role in tactical sustainable mobility projects is still contested, however, it provides the opportunity for planners to harness citizens creativity by placing themselves as an supporter for progressive citizen-led efforts, whilst ensuring safety, equity and effectiveness (Finn, 2014). This movement towards testing innovative ideas in real urban contexts is in line with a trend in planning practice of planners wanting to understand the social and environmental impacts of a project, which are easier to assess once a project has been implemented on a small scale. The planners no longer rely completely on selecting projects by focusing heavily on economic evaluations and forecasting traffic, as the impact of a project can be far more complex and unpredictable than focusing on these two things.

As well as allowing planners to be more responsive to the social, political, economic and environmental factors that create changes in urban planning practice, this research project has highlighted the possibilities of 'tactical sustainable mobility' projects that focus on increasing bicycle mobility. Some of the unsanctioned tactical urbanism projects came from citizens deciding to deal with mobility issues in their city by painting bicycle lanes to reclaim urban space for a more sustainable mode of transport. This shows citizen frustration at the fight for space in the city; however, these unsanctioned projects can have negative consequences especially in terms of safety and can lead to adverse effects, such as congestion. Therefore if planners are able to take these ideas from the citizens on how to deal with urban issues, then they could implement them in a more controlled environment, harnessing the enthusiasm and creativity, to push forward the implementation of sustainable mobility projects. Bicycle planning is interesting to focus on due to many of the solutions being scalable and requiring limited resources to implement. The literature review in section 4.3 also highlighted the recurring theme of tactical approaches to bicycle planning. In addition, the two bicycle projects implemented by Stavanger municipality, the bicycle priority road and the bicycle sharing scheme, required limited resources to begin the implementation process, were scalable and could be based on similar successful projects that have been implemented across Europe. In addition, bicycle planning is a growing focus of sustainable mobility in many of the municipalities interviewed, and this trend can be seen across Europe and worldwide. Therefore the ability to build upon this 'buzz' by actually implementing physical projects will only further emphasise the importance of bicycle planning if the projects are successful. Tactical approaches can therefore be used to help foster the implementation of greater numbers of projects.

On the other hand, 'tactical sustainable mobility' faces a number of challenges in terms of leading to successfully implemented projects. Firstly, the limitations of tactical projects have to be understood by planners, so that tactical projects are implemented in the scenarios that are most advantageous. Silva

(2016) notes that one of the main challenges of tactical projects is finding a role for tactical approaches within the current planning processes. This research project does not claim that 'tactical sustainable mobility' projects should be the only type of planning that should occur to encourage a shift in mobility towards more sustainable practices. Instead large scale infrastructure projects may be required in some cases, but where its not possible due to sustainable mobility barriers, like funding, then tactical approaches should be explored to push forward and keep sustainable mobility at the forefront of urban planning debate.

Additionally, the planners will to encourage and foster innovation in sustainable mobility planning is required at a municipal level. It requires planners who are willing to make changes to the formal planning processes and carefully consider stakeholder involvement in order to get the most out of the tactical projects. Therefore planners are challenged to create planning processes whereby citizens are engaged and the planners consider the citizens right to city, and their voice in the use and creation of urban space. The opportunities presented will only have a significant impact on mobility practices if stakeholders are aware of projects and the benefits of tactical projects. The planners at the five northern European municipalities all showed high levels of desire to implement new projects and actively used national and international networks to share knowledge on the implementation of sustainable mobility projects. The example projects provided by Stavanger and Skive municipalities illustrated how in these projects the planners have adopted approaches from abroad that are defined by tactical characteristics. Despite this research defining the examples from the two municipalities as tactical sustainable mobility projects, the term 'tactical' was not used by planners to describe the projects. Therefore it could be beneficial in the future if a specific framework for how to operate in planning practice when undertaking 'tactical sustainable mobility' projects is created to guide planners and encourage the use of tactical approaches in formal planning practice, rather than being seen in a negative light relating to unsanctioned projects.

In conclusion, tactical sustainable mobility projects can be seen as an opportunity for planners to facilitate a shift towards more sustainable mobility practices within their city, as the characteristics of tactical approaches allow for more innovative projects to be implemented and tested in real life urban contexts, despite the current barriers facing sustainable mobility planning practice at a municipal level. The planners interviewed all came from cities with different organisational structures in terms of planning for mobility, however there was a recurring desire from the planners to take concrete steps in order to achieve sustainable mobility goals, this sentiment was reiterated during the Climate-KIC mobility seminar where a planner at Aarhus municipality noted the importance of planning and implementing projects little by little. In light of this, tactical sustainable mobility can be seen as a way to overcome a number of the current barriers through temporary and scalable projects. I argue that a tactical mindset has been in place

when planning the three projects discussed in this research, with particular emphasis being placed on the scalability aspect of the projects, as a way to implement new innovative projects. Even though currently tactical sustainable mobility is not explicitly mentioned by the planners, the trends in urban planning, including economic recession and citizen frustration, may make the need to plan tactically evermore important in a municipal planning context. The extent, to which planners are able to use tactical approaches in overcoming current barriers to implementing sustainable mobility projects, will depend on the planners' willingness to harness the creativity and enthusiasm of citizens and work beyond the current decision-making and implementation processes, and this consequently will create challenges within planning practice when implementing future tactical sustainable mobility projects.

9 CONCLUSION

The aim of this research project was to bring together the issue of how to implement sustainable mobility projects within the current urban planning municipal context, which is faced with a number of political, planning practice and citizen level barriers, and tactical sustainable mobility as a potential approach to encourage the implementation of sustainable mobility projects.

Tactical sustainable mobility projects originally came in the form of unsanctioned, activist and community led projects, however, it has also been and is increasingly becoming apparent in more traditional forms of municipal planning practice. The three example projects discussed in section 7.3 highlight how municipal planners are using tactical approaches in order to advance the implantation of sustainable mobility projects. The two characteristics that define tactical sustainable mobility in this research, temporary and scalable, both provide opportunities for planners to improve efficiency, effectiveness and democracy in the decision making and implementation processes by creating a situation where citizen engagement is increased, funding opportunities are maximised and projects can be tested in a real urban context. The incremental aspect of planning practice, which was discussed by planners in a number of the municipalities, puts emphasis on reaching the end goal or vision by undertaking small steps along the way. This is in line with the tactical mindset focusing on the process of implementation as an important part of reaching ambitious goals set at a national and municipal level.

The planners noted that although economic evaluations of potential sustainable mobility projects occurred on large-scale infrastructural projects, the projects on a smaller scale did not require this level of evaluation and therefore planners chose to test innovative ideas that have been implemented in other cities first. The use of online platforms and EU meetings to discuss the opportunities and complications that have arisen in different cities provided enough background knowledge for planners to implement pilot projects in their own cities. This way of planning is very much in line with tactical sustainable mobility, as the projects tend to be on a smaller-scale and are tested before further implementation takes place in the city. The case of the bicycle priority street in Stavanger, showed how tactical approaches can led to substantial change in political backing. Once the project was implemented this allowed the politicians and citizens to experience the project fully, increasing the awareness of stakeholders to a greater degree when physical projects are shown. Leading, in this case, to politicians investing further funding into bicycle infrastructure across the city, showcasing how a small-scale project can lead to a lasting impact on sustainable mobility practices in a city.

Stavanger's bicycle sharing scheme and Skive's biogas projects also both helped to reduce the barriers surrounding implementation of sustainable mobility projects. In particular the projects allowed the

municipalities to test innovative ideas to overcome the physical topography and built environment of the respective cities. Without the innovative aspect of tactical sustainable mobility projects, the planners may have struggled to implement these projects as the cities face high levels of private vehicle dependency.

A main challenge facing tactical sustainable mobility is the relationship between unsanctioned and sanctioned projects. I argue that although unsanctioned projects may provide insight into urban planning issues highlighted by citizens, tactical sustainable mobility needs to be adopted into formal planning practice due to the safety concerns and potential for other adverse effects, like congestion. Therefore, even though tactical projects were originally seen as a response to the unresponsiveness and failures in the formal planning system, planners are already and need to continue to make use of tactical approaches by implementing temporary or scalable projects that can help municipalities reach wider strategic goals.

It is clear from this research project that the planner's role within sustainable mobility planning has changed due to the shifting political, social, economic and environmental conditions that impact planning practice. The municipal planners note an increased focus on implementation of physical projects in order to create a shift towards sustainable mobility practices. Therefore to advance the implementation process they have been focusing on the incremental side of planning practice to achieve municipal goals and have chosen projects that are scalable, a characteristic of tactical sustainable mobility, in order to overcome the barriers to implementation.

Although this research illustrates that municipal planners are using tactical approaches to create opportunities within sustainable mobility planning, it is still unclear what the exact role a planner should take in tactical projects and how to involve citizens in this process to take advantage of the benefits that tactical sustainable mobility can produce, including increased efficiency and democracy in planning processes, and harnessing the creativity of citizens. Therefore it would be interesting for further research to be undertaken regarding the relationship between formal municipal planning practice and citizens involvement in the implementation of tactical sustainable mobility projects. In addition, the possibilities to enhance citizen engagement through tactical approaches should be explored, as a shift towards sustainable mobility is heavily reliant on awareness, acceptance and behavioral change from the citizens.

10 REFERENCES

Aalborg Kommune. (2013) Mobility Strategy 2013-2025. Online PDF: http://www.e-pages.dk/aalborgkommune/875/html5/ Date Accessed: 20th June 2017

Andersen, J. (2016, 12 20).Transport Planner at Aalborg Municipality. (C. Mullin, Interviewer)

Allmendinger, P. (2009) Planning Theory. Palgrave: UK

Attard, M., & Shiftan, Y. (2015). Sustainable Urban Transport – An Introduction. In M. Attard, & Y. Shiftan, *Sustainable Urban Transport. Transport and Sustainability, Vol. 7*, pp. 15-26. Emerald Group Publishing Limited.

Banister, D. (2005) Overcoming barriers to the implementation of sustainable transport. In Rietveld, P.P. & Stough, R.R., Barriers to sustainable transport institutions, regulations and sustainability. Spon Press, Oxford, pp. 54–68.

Banister, D (2008) The sustainable mobility paradigm. *Transport Policy*, Vol. 15, pp. 73-80.

Banister, D. (2011). Cities, mobility and climate change. *Journal of Transport Geography, Vol. 19, No.* 6, pp. 1538-1546.

Barata, A.F. & Fontes, A.S. (2017). Tactical Urbanism and Sustainability: Tactical Experiences in the Promotion of Active Transportation. *World Academy of Science, Engineering and Technology International Journal of Civil, Environmental, Structural, Construction and Architectural Engineering*, Vol. 11, No. 6.

Berg, C. (2016, 11 25). Advisor in the Urban Development and Transport Department at Stavanger Kommune. (C. Mullin, Interviewer)

Birdsall, M (2015) Knowing how far your feet can take you: ‘‘Walk [your city]’’ paves the way for pedestrians. *ITE Journal*, Vol. 85, No. 5, pp. 36–38.

Bishop, P. & Williams, L. (2012). The temporary city. Routledge:New York.

Børresen, R. (2016, 11 11). Head of Bicycle Initiatives in the the Park, Road and Bicycle Department at Stavanger Kommune. (C. Mullin, Interviewer)

Brenner, N (2015) Is “Tactical Urbanism” an Alternative to Neoliberal Urbanism? Post: Notes on Modern & Contemporary Art Around the Globe. Website: http://post.at.moma.org/themes/15-uneven-growth-reflections-on-a-curatorial-process. Date accessed: 1st June 2017.

Bryman, A. (2012) Social Research Methods. Oxford: Oxford University Press.

Chantry, E (2013) The New, New Urbanism. Website access: https://helmofthepublicrealm.com/2013/01/27/the-new-new-urbanism/. Date accessed: 1st August 2017.

Creswell, J.W. (2014) Research Design: Qualitative, Quantitative and Mixed Methods Approaches. Sage: Thousand Oaks, California.

Cochrane, A. (2013) Interviews. In Ward, K., Researching the City: A Guide for Students. London: SAGE Publications Ltd. pp.38-53.

Copenhagen Solutions Lab (2017). Street Lab. Website Access: http://cphsolutionslab.dk/street-lab/. Date Accessed: 26th June 2017.

Denmark. (2014) *Most Liveable City: Copenhagen Reclaims The Title Again*. Retrieved December 20, 2016, from Denmark, The Official Website of Denmark: http://denmark.dk/en/green-

living/copenhagen/most-liveable-city-copenhagen/

Commission, E. (1992). *White Paper on The Future Development of the Common Transport Policy - A global approach to the construction of a community framework for sustainable mobility*. Retrieved October 2016, from http://aei.pitt.edu/1116/1/future_transport_policy_wp_COM_92_494.pdf

Commission, E. (2001). *White Paper: European transport policy for 2010: time to decide.* Retrieved October 2016, from https://ec.europa.eu/transport/sites/transport/files/themes/strategies/doc/2001_white_paper/lb_com_2001_0370_en.pdf

Commission, E. (2006). *Keep Europe moving: Sustainable mobility for our continent. Directorate-General for Mobility and Transport.* Brussels: European Commission. Retrieved October 2016, from http://europa.eu/rapid/press-release_IP-06-818_en.htm?locale=en

European Commission. (2007). *Green Paper - Towards a new culture for urban mobility.* Brussels: European Commission. Retrieved from http://eur-lex.europa.eu/legal-content/EN/TXT/HTML/?uri=CELEX:52007DC0551&from=EN

European Commission. (2011). *Roadmap to a single European transport area: Towards a competitive. White Paper, COM.* Brussels: European Commission. Retrieved from http://ec.europa.eu/transport/themes/strategies/2011_white_paper_en.htm

European Commission (2015). Nye metoder til udvikling og udnyttelse af biogas. Website access: http://ec.europa.eu/regional_policy/da/projects/sweden/finding-new-ways-to-develop-and-exploit-biogas

Commission, E. (2016). *A European Strategy for Low-Emission Mobility.* Brussels: European Commission.

Fabian, L. & Samson, K. (2016) Claiming participation – a comparative analysis of DIY urbanism in Denmark. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, Vol. 9, No. 2, pp. 166-184.

Farthing, S. (2016) Research Design in Urban Planning: A Student's Guide. SAGE: London.

Finn, D. (2014) DIY urbanism: implications for cities. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, Vol. 7, No. 4, pp. 381-398.

Fischler, R. (2000) Communicative Planning Theory: A Foucauldian Assessment. *Journal of Planning Education and Research*. Vol.19, No. 4, pp. 358 – 368.

Fischler, R (2012) Reflective Practice. In Sanyal, Bishwapriya, et al. (2012) Planning Ideas That Matter : Livability, Territoriality, Governance, and Reflective Practice, MIT Press.

Flyvbjerg, B. (2001) Making Social Science Matter: Why social inquiry fails and how it can succeed again. Cambridge University Press.

Forester, J. (2012) The Deliberative Practitioner: Encouraging Participatory Planning Processes. MIT Press: Cambridge.

Fraser, B (2011) Henri Lefebvre and the Spanish Urban Experience: Reading from the Mobile City. Bucknell University Press.

Friedmann, J. (1987) Planning in the Public Domain: From Knowledge to Action. Princeton University Press: Chichester.

Gertrud Jørgensen & Thorkild ærø (2008) Urban Policy in the Nordic Countries—National Foci and Strategies for Implementation. *European Planning Studies*, Vol.16, No.1, pp. 23-41.

Giduthuri, V. (2015). Sustainable Urban Mobility: Challenges, Initiatives and Planning. *Current Urban Studies, 3*, 261-265. Retrieved from http://www.scirp.org/journal/cus http://dx.doi.org/10.4236/cus.2015.33022

Habitat International Coalition (2017). HIC - World Charter for the Right to the City. PDF downloaded from: http://hic-gs.org/document.php?pid=2422. Date accessed: 23rd July 2017.

Harvey, D. (2008). "The right to the city". *New Left Review*, Vol.2, No.53, pp. 23–40.

Harvey, D. (2012). Rebel Cities: From the Right to the City to the urban Revolution. London and New York: Verso, pp. 67-88.

Healey, P. 1996. The communicative turn in planning theorv and its implications for spatial strategy formation. *Environment and Planning B. Planning and Design*, Vol. 23, No. 2, pp. 217-234.

Healey, P (2012) Chapter 13. Communicative Planning: Practices, Concepts and Rhetorics. In Sanyal, Bishwapriya, et al. (2012) Planning Ideas That Matter : Livability, Territoriality, Governance, and Reflective Practice. MIT Press.

Hughes, J.A. & Sharrocks, W.W. (2007) Theory and Methods in Sociology: An Introduction to Sociological Thinking and Practice. Palgrave Macmillan: Hampshire.

Hoch, C. 1996. A pragmatic inquiry about planning and power. In Explorations in Planning Theory, S.J. Mandelbaum, L. Mazza, and R.W. Burchell, pp. 30-44. New Brunswick, N.J.: Center for Urban Policy Research, Rutgers University.

Fischler, R. (2000) Linking planning theorv and history: The case of early development control. *Journal of Planning Education and Research*, Vol. 19, No. 3, pp. 233-241.

Homrighausen, J.R. & Tan, W.G.Z. (2016) Institutional Innovations For Sustainable Mobility: Comparing Groningen (NL) and Phoenix (US). *Transportation Research Procedia*, Vol. 19, pp. 151 – 163.

Hou, J. (2010). (Not) your everyday public space. In: Hou, J. Insurgent public space: guerrilla urbanism and the remaking of the contemporary city. Routledge, London, pp. 1–18.

Holden, E (2007) Achieving Sustainable Mobility. Ashgate Publishing Ltd.

Hughes, J.A. and Sharrock, W.W. (1997) Positivism and the conception of science. In: The philosophy of social research. Longman Social Research Series.

Iveson, K. 2013. Cities within the City: Do-It-Yourself Urbanism and the Right to the City. *International Journal of Urban and Regional Research, Vol.* 37, No. 3, pp. 941–956.

Jacobs, J. (1961) The Death and Life of Great American Cities. Vintage:New York.

Jørgensen, G & Ærø, T 2008, ' Urban Policy in the Nordic Countries: National Foci and Strategies for Implementation ' *European Planning Studies* , Vol. 16, No. 1, pp. 23-41

Kvale, S. and Brinkmann, S. (2015) Interviews: Learning the craft of qualitative research interviewing. Sage publications.

Lefebvre, H (1996) Writings on Cities. Wiley.

Leinberger, C.B. (2009). The Option of Urbanism: Investing in a New American Dream. Island Press.

Leonard, R (2015) Green Infrastructure grows up. *Planning*, Vol. 81, No. 6, pp.16-21.

Low, N., & O'Connor, K. (2013). The dilemma of mobility. In N. Low, Transforming urban transport : the ethics, politics, and practices of sustainable mobility (pp. 3-25). Oxon: Routledge.

Lydon, M., Bartman, D., Garcia, T., Preston, R. & Woudstra, R. (2012). Tactical urbanism vol. 2: short term action || long term change. Online: http://issuu.com/streetplanscollaborative/docs/tactical_urbanism_vol_2_final. Date accessed: 20th June 2017.

Lydon, M & Garcia, A (2015) Tactical Urbanism: Short-term Action for Long-term Change. Island Press. The Streets Plans Collaborative, Inc: Washington.

LSE Cities. (2015) Ideas Competition: Designing the Urban Commons. Online: https://lsecities.net/media/objects/events/designing-the-urban-commons. Date accessed: 27th June 2017.

Marshall, S., 2001. The challenge of sustainable transport. In: Layard, A., Davoudi, S., Batty, S. Planning for a Sustainable Future. Spon, London, pp. 131–147.

Marshall, W.E., Duvall, A.L. & Main, D.S. (2015) Large-scale tactical urbanism: the Denver bike share system. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, Vol. 9, No. 2, pp. 135-147.

Mitman, M. & Rixley, A. (2015). The Transportation Planner and Engineer's "Hack". Institute of Transportation Engineers. ITE Journal; 85, 1; pg. 26.

Mould, O (2014) Tactical Urbanism: The New Vernacular of the Creative City. Geography Compass 8/8 529-539.

Næss, P., Strand, A., Næss, T., & Nicolaisen, M. S. (2011). On their road to sustainability?: The challenge of sustainable mobility in urban planning and development in two Scandinavian capital regions. *Town Planning Review, 82*(3), 285-316.

Nemeth, J & Langhorst, J (2014). Rethinking urban transformation: Temporary uses for vacant land. Cities Volume 40, Part B, October 2014, Pages 143–150

Nielsen, T. (2016, 11 03). Project Manager in the Energy City Department at Skive Municipality. (C. Mullin, Interviewer)

Nieuwstraten, J. (2016, 12 19). Advisor for the City of Amersfoort. (C. Mullin, Interviewer)

Page, S (2008) DIY Urbanism. Planetizen blog post. Website access: https://www.planetizen.com/node/30577

Pascua, J Florida State University (2007). Tactical Urbanism:. Changing the Landscape from the Bottom-Up. Presentation

Peck, J. (2005). Struggling with the creative class. *International Journal of Urban and Regional Research* 29, pp. 740–770.

Prichard, J. 2010. “Better Bikeways: Guerrilla Improvements and DIY Signage.” *GOOD Magazine* (Online). 14 May 2010. Accessed June 7, 2017. http://www.good.is/post/better-bikeways-guerrilla-improvements-and-diy-signage/

Purcell, M. (2013) Possible Worlds: Henri Lefebvre and the Right to the City. Journal of Urban Affairs, Vol 36, Issue 1, pp. 141-154.

Rebar, 2009 Park(ing) Day Manuel Booklet. PDF version: http://parkingday.org/src/Parking_Day_Manual_Booklet.pdf

Rebar, 2017. About Parking Day. Website access: http://parkingday.org/about-parking-day/. Date accessed: 12th July 2017.

Rietveld, P.P. & Stough, R.R. (2005) Institutional dimensions of sustainable transport. In P. P. Rietveld & R. R. Stough, Barriers to sustainable transport institutions, regulations and sustainability. Spon Press, Oxford, pp. 1-17.

Roushar, J (2015) Bicycling in Stavanger Norway. Website access: http://longlostcousin.com/2015/07/bicycling-in-stavanger-norway/. Date accessed: 13th August 2017.

Sager, T. (1994) Communicative Planning Theory. Aldershot, UK: Hants: Avebury.

Schiller, P., Bruun, E., & Kenworthy, J. (2010). Highly Mobile Planet and Its Challenges: Automobile Dependence, Equity and Inequity. In P. Schiller, E. Bruun, & J. Kenworthy, An Introduction to Sustainable Transportation – Policy, Planning and Implementation (pp. 1-21). London: Earthscan.

Schön, Donald A. (1983) The Reflective Practitioner: How Professionals Think in Action. New York: Basic Books.

Silva, P. (2016) Tactical urbanism: Towards an evolutionary cities' approach? *Environment and Planning B: Planning and Design*, Vol. 43, No. 6, pp. 1040–1051.

Søgaard, H. (2016, 12 19). Project Assistant in the Mobility and Urban Space Department at the City of Copenhagen. (C. Mullin, Interviewer)

Stavanger Aftenblad (2016) 'Nå males Møllegata knallrød' Website access: https://www.aftenbladet.no/lokalt/i/8W2Rd/Na-males-Mollegata-knallrod. Date accessed: 20th August 2017.

Street Plans Collaborative (2017). Open Streets Project. Website access: http://openstreetsproject.org/about/. Date Accessed: 13th July 2017.

Talen, E. (2012). New urbanism. In A. T. Carswell (Ed.), The encyclopedia of housing (Vol. 2, pp. 513-517). Thousand Oaks, CA: SAGE Publications Ltd.

Talen E (2015) Do-it-yourself urbanism: A history. *Journal of Planning History*, Vol. 14, No. 2, pp. 135–148.

Trudeau, D. (2013) A typology of New Urbanism neighborhoods. *Journal of Urbanism: International Research on Placemaking and Urban Sustainability*, Vol. 6, No. 2, pp. 113-138.

Vergragt, P.J. & Brown, H.S. (2007) Sustainable mobility: from technological innovation to societal learning. Journal of Cleaner Production, Vol. 15, No. 11-12, pp. 1104-1115.

Walljasper, J. (2007) The Great Neighborhood Book: A Do-it-Yourself Guide to Placemaking. New Society Publishers: Gabriola Island, BC.

Yedla, S (2015) Barriers for the implementation of NMT and other cleaner modes of transport. In Yedla, S (2015) Urban Transportation and the Environment: Issues, Alternatives and Policy Analysis.

Yin, R. (2003). Case study research: design and methods. Thousand Oaks, Calif.: Sage Publications.

Zimmerman, M (2015). We Own This City. *Planning*, Vol. 81, No. 7, pp. 30-34.

11 APPENDIX

11.1 APPENDIX 1: INTERVIEW GUIDE

[Interview questions had to be adapted to each interviewee as not all questions were relevant in every municipal context.]

- Does your municipality have an overall goal for sustainable transport?
- Are EU sustainable transport requirements a large consideration when creating sustainable mobility goals in the transportation plan at your municipality?
- What is the selection process for sustainable transport measures in your department?
- How are you currently evaluating prospective transport measures? What data do you use?
- Do you take inspiration from other cities regarding possible sustainable transportation solutions?
- What are some of the barriers to implementing sustainable transportation measures at your municipality?
- How do you communicate the results from implemented measures?

11.2 Appendix 2: Interviews with European Municipalities on Current Sustainable Mobility Planning in a Local Planning Context

11.2.1 Helene Albinus Søgaard – Project Assistant, Mobility and Urban Space

What we have been doing sometimes when focusing on bicycling, we have been looking into socio-economic benefits in terms of moving people from the car in rush hour to the bicycle and then also health benefits of the bicycle. That's also a way of measuring the social impacts in an economic way, so it's not necessarily the homogeneity or like the interaction between people I think it's difficult to measure these social impacts.

Does your municipality have an overall quantifiable goal when it comes to sustainable mobility?

We have a vision of becoming CO2 neutral by 2025, and the, or carbon neutral, and the time schedule for that is 2025 and currently we've had part goals like temporary goals, so by 2015 the transport sector needs to reduce its emissions by 10% of the overall emissions.

Is that related to the EU requirements?

I'm not sure I was not working here before the process up to so maybe I will check and get back to you on that one.

[Email message received from Helene:

I have just discussed with my colleague regarding your first question on EU sustainable transport requirements. The point of view is that if they would be more ambitious they could play a bigger role than now when creating the sustainable mobility goals in the Climate Plan. Currently they have a minimum of influence.]

What is your process for selecting sustainable mobility measures?

I think it's really a political process it's really what is up in the media also and what is relevant to the agenda and there is definitely something's that are easier to do than others. And I think what we currently experience is that the restrictions on the car traffic is so unpopular among the politicians so that's a no go but then they still want to have a liveable city they still want to have the green areas so in that sense its difficult, I mean it's easy to have the vision but when it comes to the exact political will it is maybe lacking. So the measures we choose and the money we get to choose different measures really depend on what politicians give the money for.

Are you currently evaluating the mobility measures that you have already implemented?

We have this currently in 2012 we made an action plan for green mobility and currently we are doing a mid-term evaluation for that and it's not necessarily clear in the action plan but its 2020. So it'll run out in 2020 even though some of the goals are for 2025 the actual plan is timed to run out 2020. So currently we are making a mid-term evaluation of that action plan but it's still in progress. So in that sense we are evaluating measures, looking at what measures were started, what did we find out or how far did we come, you know a lot of these things are also difficult to measures in that sense because you plan something and then the reality just becomes something completely different in the end you know. A lot of this plan was initiated with the prospect of having a congestion charge that was really a political issue in 2011/12. During this process of this action plan it was really uncertain so that had a huge influence.

Do you take inspiration from other cities in regards to new sustainable measures?

Definitely, we are lucky to be engaged with a lot of EU projects and have been so far, where we have a lot of exchange of information on what they are doing all over Europe. And we are coming to conferences and stuff as part of the work, there the connection to people working in other municipalities and having the international network among the employees within the transport sector is definitely an important part.

Do you meet on a regular basis?

It depends on what EU projects you are engaged with but then you also have all the conferences, really important conferences and the upgrading of the employees then you can go to conferences. So in that case I would say yes it's fairly regularly but it's not necessarily this amount of time we have to assign to this. It depends on the news quality and the conference content.

Have you experience barriers to implementing new sustainable mobility measures?

I think the financing is definitely an issue and then also the political vision, which I mentioned before is changing but also there's a difference between having a political vision and then taking the specific concrete steps forward. For example, on parking issues removing parking in city centre you know that's really difficult, it's a long political process to make that come through and implement that measure. So in that sense the fight over space is dominant. Definitely, you need green areas, you need road space, you need bicycle space, you need public space, public transport space, you needs buildings, parks everything.

It really depends on the politicians as well so when we had Klaus Bondam (2006-10), when he was technical and environmental mayor and together with Ritt Bjerregaard who was lord mayor at that time. They were really progressive in terms of the bicycle infrastructure. And so I think that the management of or the success of having bicycling so high on the agenda, as the world's best bicycling city, is definitely

part of the politicians foundation so in that sense it's the fundamental idea of the city of Copenhagen, so in that sense it's still on the agenda for them.

Because it's a powerful branding tool?

Yes, exactly. But then also barriers you have national legislation so projects like environmental zones are difficult in enlarge. As its national legislation so if you have any other ideas of how you want to do it you are limited towards that. Then also with the congestion charge that's also a national legislation issue and the environmental price differentials in terms of parking or electric vehicles that's also national legislation. So it's always the frame for what the municipality can do really. You know is shaped by the national legislation.

11.2.2 Christin Berg – Planner at Stavanger Kommune

Is there an overall goal for sustainable transport in your department?

Yes, in this department we are working towards the zero growth in personal car mobility. And that's from the overall national goal for aiming that the growth is not going to be in car mobility but other types of transportation mode. The city has a growth in population which means that we will have a lower modal split of car use in the future. But then from the environmental point of view that's not enough to meet the goals for climate so now we are working on a municipal environmental plan and revising that, then we are looking into what we can do to go lower than zero growth in private car mobility.

Do EU requirements play a role in the creation of mobility goals/iniatives?

This national goal is based on international goal and than calibrated with EU goals I think and then it comes down to the municipal level. So in a way its all linked together and we have some EU projects which try to be best practice with using ITS and so on.

How do you select sustainable mobility measures?

We have worked a while looking at mobility instead of each transportation mode and look at them as connected in a way and we work in new plans with mobility hubs where you can have mobility services like car sharing, possibility to have electric cars and use the batteries for other purposes in that local area or battery force for energy. And you have the bikes there also. So we work in that direction in plans on a more general level then we have a passage in our municipal plan to make businesses responsible or the people outside the municipality responsible for how we do transport. We have a passage that says that businesses of a certain size have to make a mobility plan, as a requirement, over a 1000 sq metres or 50 employees.

How are you currently evaluating these mobility measures?

We get the plans and use them actively in the decision making process and this requirement is on all levels so a plan for an area you look at it on a higher level and then you implement new measures on a lower level and then you come to the building level and you have to make a mobility plan also to make sure that you are fitting the requirements on a higher level plans.

Have you collected data on the success of these measures?

We evaluated this measure a couple of years ago and the main results of the evaluation was that it was useful. We were the first municipality in Norway that introduced this measure. So we looked into if it was useful and it was because we got more information about what was needed in terms of transport and mobility and then we also tried to see how much of a reduction in CO2 could this create. But it was difficult to actually measure the effects because this measure had not worked for a long enough time to see the full effects from the planning phase to the implementation phase.

Have any of the projects you have worked on been used as best practice in other cities?

The evaluation project we had was sponsored by …nova now its connected to innova and sandas the neighbouring municipality implemented it, the two other neighbouring municipalities and several other municipalities in Norway that have been interested in results. Brama for instance in the eastern part of Norway im not sure if they implemented it but they tried to use the measure themselves in a slightly different way. They haven't had it in the municipal plan as there requirement.

Has your city taken any inspiration from other cities itself?

We took part in the future cities programme and there were many interesting things from it including that we met in different settings and could discuss how to improve bike facilities, pedestrians as well which might have come a bit later in how we are concerned with it. But biking facilities and how to promote bike use has come pretty far in how we discuss amongst different municipalities on specific things like which type of red tarmac should you use, what kind of motivation activities are useful and so on. And that's linked to bicycle network as well, the national bicycle network which was a broader set before but since future cities its kind of been more focused towards the same cities as well. So you have the smaller/medium cities and the bigger cities, like Oslo, Bergen, Stavanger, Trondeim. As the possibilities are different – the size of the cities make things possible in a different way and both the financial and population that would use this being different who would use the bike lanes and if more urban.

Do you think the ability to share knowledge is a useful, relevant thing?

I have been working with research over the years so from that perspective and part of my work experience. You gather all the information you need from different literature, empirical data from different places, but when you work in a municipality you don't always have the time to broaden up before you focus down and there are different types of databases that you can use, amongst others (Norwegian website www.tiltax…no) which in a way is very good with best practice cases and you can get short background information on the measure and how to implement it and how its used in different places. I'm using this tiltaxcatalogan more and more because I know that I find articles, which are interesting and can kind of give easy access to the basic background you need if you want to write something to the politicians or something. When its easy to access and you get the "right" answer you get what your looking for and the measure you are trying to implement because I worked a lot with pedestrian and bicycle use. When we tried to provide better infrastructure for bikes its kind of innovation in every project so you don't always get a background of whether this is a good or bad idea.

Are there any barriers to implementing sustainable mobility measures at your municipality?

There are different types of barriers both you get to focus on this innovation like when I worked with the municipal plan and this transport strategy in the municipal plan we had a zero vision of private car mobility that is underlining the whole municipal plan. I presented this for an audience and then someone in the audience said "I worked for the transportation department 20 years ago and we said the same thing then but it hasn't changed and gone in that way and my hypothesis is that you haven't done what you needed to do, haven't done the innovation needed in the meantime to get to where you put the goals so in that respect its kind of difficult to make the changes for getting to a more environmental mobility.

Do you communicate these results to the public?

Yes we actually opened a bicycle street today, which is the first one in Norway of its kind and we had children, politicians on the street. And these politicians were very eager to promote what we do and have just decided to put even more money into bicycle infrastructure and like you said you have been in contact with Roar Børresen, he has been able to change the perspective a bit instead of only providing infrastructure the municipality have made an effort to talk about what we do and do the soft measures and not only the hard ones.

Bicycle only street has been copied form Holland, you have similar streets in Germany, Belgium etc., but used the Holland model because they have the clearest concept of that kind of street, which is coloured

red in the middle with bike symbols for them to know it is okay to bike there and pedestrians have the sidewalk. So it's an ordinary street with a red floor in a way.

11.2.3 Røar Børresen: Head of Bicycle initiatives at Stavanger municipality

You work as head of bicyle initiatives, which is within the park and road department. How is your department set up?

We are separated within the department, and it is now the park, road and bicycle department. So our name is a bit old. Earlier biking was seen as only a project and now it is a section in itself.

What sort of bicycle initiatives are you working on at the moment?

We have a focus on separating the modes of transport, those who go by foot, bike and car. And of course we also have lanes where we have shared space. We have just finished a project called bike priority street we are painting the whole street red and with bike symbols in the street.

Is that happening at numerous locations around the city?

That's just happening in one at the moment, an 800m road and it's just finished and it's the first in Norway actually.

How did you come up with that idea?

We visited Zwolle, in the Netherlands.

And you're just testing out if it works on one street and the expanding?

Yes, and then we will paint more.

Your aim is to increase travel by bike by 1% each year, do you have a broader environmental goal?

Our main goal is to get more bike riders. We are organised in a way that we have three focus areas. One is to make bike lanes, to make it easier to be a cyclist in Stavanger, including bike parking and that sort of things. And second is maintenance we guarantee open bike lanes 24/7 all year round so in the winter we are salting. And the third is information and campaigns. We are trying everything.

Are you also starting to implement city bikes?

We started that initiative together with a company right out of town it is in Stavanger but it's not in the centre. Its where all the offices are placed.

So it will be used for commuting purposes?

Yes, right. So we have electrical city bikes from københavn gold bikes. It's the same you have in København.

With these initiatives, how do you pick which initiatives to implement?

Its quick easy because Stavanger is not like oslo, or københavn or London. Not many people live in the centre so you go there to buy a dress or suit or to go cinema, museum. We don't go there to get from one place to another. The centre is quite small actually, so you can walk most of the streets in a short time. And to get out of the centre it is surrounded by hills so you have hills around the whole city centre. And the normal city bikes are heavy so that's why we thought it would be smart to have the electric bikes. And we went to københavn and saw how the bike space looked, so we decided to do it here as a pilot project actually. And now it's getting somewhere it seems.

Are there any barriers you have had to overcome when implementing bicycle initiatives?

It has been a car city so that is a barrier that has to be overcome. Every house has two cars or more each and it's very normal to go to work by car.

So there's had to be a behavioural change then?

Yes.

Have many people changed their behaviour since?

I think we have the wind on the back and I think we are going the right way but there's a long way to go. And the infrastructure is made mainly for cars, so we are starting now with the separating job.

11.2.4 Jacky Nieuwstraten – Advisor for the City of Amersfoort

Does your municipality have an overall goal for sustainable transport?

The city has no quantifiable goal for urban mobility. However this concept is a key part of the city's climate plan and the there is also a specific mobility plan in place for the city. The mobility plan attempts to influence the continued take-up of cycling in the city, as a main focus. They are also looking at how to connect and increase mobility for people from the surrounding area coming to the city centre. Jacky noted that although the concept of sustainable mobility is rather new it is very much engrained in planning across the Netherlands now.

The city of Amersfoort is currently focusing on how to make the city smarter, with a future goal to research how sensors and other technology can be used to understand mobility in the city and to further the implementation of successful urban mobility strategies.

Are EU sustainable transport requirements a large consideration when creating sustainable mobility goals in the transportation plan?

The EU requirements are considered, however there needs to be an understanding of what people want and need at a local level. There has to be the public and corporations involved in the planning process, it cannot just be planners. So even though the EU requirements are important it has to make sense in a local context.

What is the selection process for sustainable transport measures in your department?

In the selection process they have involved businesses and a variety of other public stakeholders in the process. This is in order to again new perspectives and innovative ideas that can be used. Jacky notes that it is vital to get innovative input, which the municipality may not have thought of.

They have implemented charging stations with specific parking spots for electric vehicles, however it is hard to know the exact demand and this is something which Jacky noted would be very useful in the future. To allow for mobility planning to be more accurate. At the moment they can tell if there is a need for electric vehicle parking by the requests we receive at individual addresses across the city but a larger set of data would allow for a greater accuracy of provision.

The city has also looked at ways to keep large vehicles for distribution out of the city centre, as a way to prioritize more sustainable modes of transport. They have tried different alternatives for distributing by more sustainable means.

What are some of the barriers to implementing sustainable transportation measures at the City of Amersfoort?

Always many barriers when implementing sustainable mobility measures, with one of the main ones being the dependence on public approval and input in order to select and implement successful measures.

How do you communicate the results from implemented measures?

They haven't used it so much for branding at this point, however in the future they want to look at ways to do this and make the public even more aware of the importance of sustainable mobility and how it is currently being implemented in their city.

11.2.5 Teresa Nielsen: Project manager in the Energy City Department at Skive Municipality

Our department work with all kinds of climate and energy projects in skive municipality. Skive municipality have a political position that the city has to be CO2 neutral by 2029, so we work with

different projects to reduce the CO2 and work on both international and local projects and one of the big issues we have to work with is the transport sector because in our energy table we can see that transport is the largest area with CO2 so we have to do something here. One of the things we have done here is biogas for transport.

Are you proactive when it comes to facilitating sustainable urban mobility?

Yes, in a way it is a new area we have to talk about in skive because mobility is a big issue and the political want us to do something about it. But we haven't started anything to do with it yet we just have to get started at the urban mobility soon but in skive we are not a big city like Aarhus or Copenhagen so we don't have the same problems as those cities so we have to see what our mobility problems and opportunities are when we get started.

In what way do the current EU sustainable transport requirements play a role in how you deal with sustainable mobility? Has that made it more important of an issue?

Yes, of course, because when urban mobility plan is a requirement it will come to our table soon so we have to look at the problem and have to do something but I don't know if it is in 1 year, 2 years or 5 years we have to do something but there is some rules in EU context and we have to do something as soon as they come into play.

In the energy department do you have to work closely with other departments, like the transportation department?

Yes, our department is part of the technical department, and in the technical department there is also transport and roads and planning, so its very necessary that we work together with these departments because we cant do it alone. Its required that we have to work together between different departments in the municipality but also with other companies in skive because it is required that there is a change in society if we are to have success with it.

You are at a very early stage with mobility planning, have you managed to implement any specific sustainable transportation measures?

The only measure we have is that the skive municipality has to be CO2 neutral in 2029 and there transport is important and we have to work with it. Therefore a tool to get CO2 neutral is to focus on urban planning and mobility plans for skive. If we focus on mobility plans we of course do it for the climate and co2 but we also do it to get the city smarter and to get different parts of skive to connect easier so there is

a lot of different reasons why we have to do it. The climate is an important issue but also by getting the city smarter it creates development for the city and that is very important.

Will that also be important in terms of branding your city?

Yes, exactly. And one of our problems in skive is that all people move away from the city and move to Aarhus, Aalborg or Copenhagen. We have to get some people to move here and a smart city and a city that is greener and has higher levels of mobility. That can maybe be important for attracting people. A way to get more people to skive.

Do you think there are any barriers to implementing sustainable mobility measures at your municipality?

Yes, there are always a lot of barriers. One of the big barriers is the law in Denmark. Its old and not in the time zone we are in now so that makes a lot of barriers and we can see that with the biogas example. When you have to get greener transport to the municipality there are a lot of old laws so of course that's a big barrier. But as well there is a barrier in the people they have to see this as an opportunity to get skive to get smarter, so there are a lot of different areas we have to work with and we have to create good persuasive argument so that the public want this as well. We have to take it in small steps all the time because if you talk about a big plan and what we should be then there is a risk that the plan wont be implemented and be realistic because we work in a political arena so all the time we shift to different issues. But if we take it in small steps all the time we can get to the goal in the end.

Within your municipality, are there barriers in terms of resources and data and software?

Of course, our resources are small and if you want to work with this you have to get the resources, money and consults to make you an idea because its also a new topic for us, we don't have the expertise to work with this so we need someone like you and the universities to see in ten years, in 30 years how the city will look and what developments should we take for it. So we have to work together with a lot of people and have to listen. Also with the Urban Climate and mobility plans its very important that its not just the technical department we have to get all departments, companies and people with us. But we have to spread it out to all.

Has the current project you're doing on biogas been received well by the public and within your municipality?

Yes, biogas vehicles we have in the municipality we have about over 40 vehicles now and they have been a very big success for us right now. Right now the cars can only be driven by members of the skive municipality but we drive in the city and we have big commercials on the cars to show that we drive with

biogas so the public know that we drive on biogas and that we are an energy town and we rely on green energy. That's the main topic for the politicians and us. They know it but there hasn't been any people who have bought biogas cars privately yet.

Do you have any measures that you're thinking of implementing apart from biogas?

Only that we want to work with the future mobility for skive but we haven't started it yet so we don't know how big it will get but I know for the next two years we will work with the topic and we will find a way to start this and in skive we also work to make a new transport centre for all the car shops connected together so we have some different ideas who can have an impact on the mobility plan but we haven't finalised anything yet its still on a brainstorm level.

So you are going to all work together in the different departments to create a mobility plan?

Yes we have to talk with the other departments to see what the opportunities are for us where can we get some good quick results without too many costs and perhaps some of the other departments work can be a part of a future mobility. For example, the transport department maybe they work with a new road that can connect a new school or new part of the city together. I don't know that but we have to sit together to make a project group and figure out how we do this in skive how do we do it smart and get some results and what the economic costs are behind it.

Do you think also the size of your municipality is a strength as well because you can communicate maybe easier across departments?

Yes both, as a small municipality though we have fewer resources but it is a strength because we have the experience to work with big projects in skive and I think the mobility plan is the next big project in skive so we have experience with big projects and know how to get started and know what barriers will come because there will be barriers always so because of our experience I think we can create something very good in skive.

Within your department do you have experts in economic analysis and social impact analysis?

No, not an expert so we have to buy consults to do this and its very important that we do this because we cant start this project if we don't have emphasis on the economic and the social impacts because mobility is for the people so we have to get the social impact so it is important that we make a research and get the right consultants to do this for us. So it will cost some money but it will be worth it and otherwise we will not do the smartest thing. It is important for it to not only be the environmental but also the social and economic. We cannot make something that is difficult for the people, and if they don't see the meaning in it it wont be viable. And it wont be a success if these aren't thought of and it could create bad stories and

then its difficult to get something from negative to positive. We have to get all the research from the start and that very important. We have to see in skive where our biggest areas of mobility are is it in schools or factories, where is a lot of the mobility and where can we do it smarter and that analysis we also have to talk to the school departments as well. We have to work with very different departments not only technical but culture and schools etc. so we have to look with our eyes and so what influence these measures can have for the whole city.

You were talking about smart mobility, is that something that will be an integral part of your future plans?

We are going to make a mobility plan, and I think we have to talk about a smart mobility plan in skive because we have to see in the long term what skive is like in 10, 20 years and make a plan for that and what the new things will be that we have to plan for but at the same time we cant forget the short term planning in 5 years so you have plan for all time scales. Small steps all the time and you will follow the development and technology is developing all the time so we cant decide that we just want this, we have to be flexible and change with these developments.

Have you implemented any transport measures that are to do with ITS?

No, not yet. The only thing we have worked with is some fleet management at skive municipality. There is a map that shows where they are driving but we haven't looked at mobility for skive and how many cars are driving and in which time to go from here to here but that will be necessary research for us to have before we get started because we need to know where the mobility is and where we want to get it to. We can have a big influence on where people drive so we have to get this data beforehand.

Goal is to be CO2 neutral by 2029, do you believe reducing the number of cars is a large part of that?

Not to reduce the number of cars but to instead get green sustainable cars with biogas or electric etc. but because of our size in skive we don't have a big collective transport so when you live in skive you have a car because there is not many trains, buses and in the future there will not be that so you have to look at some different opportunities to share cars or book cars or something. We have to look at that because when you live in skive and there's a long way from a to b you need a car.

11.2.6 Jeppe Andersen – Transport Planner at Aalborg Municipality

I cannot remember our exact goal but we work towards more sustainable mobility.

Do you have a mobility department?

We don't have a specific department but we work with mobility issues as part of the transport department and also part of the urban planning department.

Have you implemented sustainable urban mobility measures in Aalborg?

We have for instance environmental zone in the city centre, where heavy trucks have to submit to the European standard for emissions. We of course try to influence a modal split improving biking and footpaths. Public transport systems.

How do you select these measures?

We have different political accepted strategies; we have a climate strategy where there are some long-term goals and actions in order to make the transport system amongst other more sustainable. We have the sustainable development strategy, which also about affecting a modal split choosing the environmental impacts of the car system. So it is shown in our overall plans and also in the master plan for the city where we try to constrain urban sprawl, land use and transport in the urban areas.

Are you currently evaluating measures that have been implemented?

We are about to evaluate some of our newest bike projects but we haven't started yet. On a lower level in respect to road safety, we also make some before and after evaluations of if we have implemented speed bumps etc.

We are evaluating the new bike crossing over the fjord which will be opening soon, we have a count of the bike traffic on the existing bridge and will get a new count once the bridge has opened to see if this measure has increased the number of bike trips across the fjord. Make more qualitative interviews about what this implied for the new users, did they find it successful. And we will make some based on national traffic survey we will try and take our some data on modal split and the number of bike trips and see if these new initiatives had any effect.

Do you take inspiration from other cities around Europe?

We are of course very inspired by other cities, so we look to both cities in Denmark, Scandinavia, EU and also internationally. We are involved in different networks about knowledge sharing, and we participate in some conferences in dialogue with other cities.

Do you see any barriers to implementing sustainable mobility measures in Aalborg?

It depends on the degree, even though there is support on some initiatives that restrict parking for the cars in the city centre or other initiatives to constrain car use, some initiative we will have political support for

but not all. There are some measure that we would like to implement but cannot for example Vesterbro city centre you can say it functions as a through fare in the city centre. We would like to see if we could get harder restrictions here in car use but not all political parties are in favour of this so its not the municipality that owns the bridge it's the directorate so there's also limits on what we can just do. Making one car lane into bus lanes in each direction we can't just do that even though the planners would find it beneficial.

Anything you would like to look at involving sustainable transport?

Of course it's very difficult but how can different transport infrastructure be used also to obtain other sustainable measures development. For instance, how it can be useful for climate adaptation.

Are there sustainable mobility projects that are important to you at the moment in Aalborg?

Previously we were working on a light rail in Aalborg but we lost the funding from the state so now we are working on BRT instead. And of course that has quite high priority but according to the modelling then this would not lower carbon emissions but increase them because even though we prioritise the transit and we make some restrictions on car use in several places that will imply that the detours made by the existing car users will have a higher impact than the shift of transport modes, so even though it is an initiative to promote more sustainable transport modes we are not sure it will lower climate emissions.

Are you collecting sensor data/using ITS?

I am not in the ITS department but we are trying to make our signals more intelligent so they can communicate better with each other and other devises. And we have also tried to use new methods in the planning, like drone looking at the city from the sky. The company Cowi has developed. And we of course make regular traffic counts at various parts of the city.

Is that data available for public use?

Yeah we have an open data lab where we place our traffic counts and other data on traffic available to everyone. We are also making a new digitalised platform where people can go in and see our registrations of traffic accidents so we are making more of our data available.

How do you go about evaluating for the smaller projects?

We sometimes have some smaller pilot projects then see what are the effects of this is and then require the approval of the police to roll the initiative out. We discuss the results with the police and then they can say there is no problem or that we can't go ahead do to this and that. So to be honest it's not often that we calculate the environmental impacts its more is this an initiative that will promote more sustainable

transport modes at the cost of not sustainable modes, so that's more that we work with these strategies and not so whether these will reduce the emissions by such an amount.