IIIEE Theses 2015:20

# Missed Connections

## Mobility Management and the Swedish Public Transport Administration

# Anna Barford

Supervisors

Peter Arnfalk (IIIEE)

Pernilla Hyllenius Mattisson (Trivector)

Elias Arnestrand (Samtrafiken)

Thesis for the fulfilment of the
Master of Science in Environmental Management and Policy
Lund, Sweden, September 2015



iiiee

THE INTERNATIONAL INSTITUTE FOR
INDUSTRIAL ENVIRONMENTAL ECONOMICS

# Acknowledgements

From the outside, the thesis process appears to be a very long and solitary journey. However, in reality it is long, but filled with helping hands. It is not only coffee, and google translate that are worthy of my thanks.

I must first acknowledge my peers. Without the panic crew, and our military stance on mealtimes and the necessity of coffee, I would surely have lost what little sanity I had upon entering the thesis block. When our supervisors collectively left on vacation, and Per Wretlind suggested that we be each other's, I initially thought he was off his rocker. However thesis dinners, and emotion sharing fikas have been instrumental to surviving this past summer.

I would like to take this opportunity to thank the members of my supervisory committee. Without the support and guidance of Pernilla Hyllenius Mattisson, Elias Arnestrand, and Peter Arnfalk my thesis would have been without a topic, audience or connections. Their time over the summer months has been appreciated, and has shaped my study.

I must acknowledge the help and insight of several insti characters who were not directly linked to my work. Lars Hansson, Jonas Sonnenschein, and Thomas Linqvist provided excellent advice and insight into the content and style of my thesis. Beatrice Kogg must also be thanked for her availability in the beginning and end of the process, as well as her belief in (and defence of) the HPP and the rights of EMP students. It is impossible to submit a work for insti without acknowledging the simple truth that without Birgitta Olofson, I would not have made it to or through the programme at all.

Outside of the walls of my academic home there were also helping hands, guiding my path. Colin Black, for reasons unknown to me, answered my emails and helped me in the beginning and middle of the process. I am very thankful for his hints and interest in my thesis, without which it may have looked very different. My yoga studio (Onehotspot yoga studio in Lund) has been a supportive sanctuary in these times. The wonderful group of people who I have met within those walls have filled my summer with positive energy and saved my joie de vivre.

I would like to thank all those who answered emails in the lead up to midsommar. I understand how tempting it must have been to insist that I wait until August for an interview, and your understanding of my situation was greatly appreciated.

Thank you Aunt for proofreading. I haven't managed to learn Swedish yet, but somehow I've lost a little English anyways.

Finally, I would like to thank my future employer, applications are currently being received for the position.

# Abstract

Kommuner and the Swedish National Government have been promoting sustainable transport in Sweden. Their actions and plans use the concept of mobility management, as well as infrastructure investments. However the public transport administrations who are responsible for the procurement of public transport in Sweden have had limited visible engagement with this concept. The purpose of this thesis was to determine if the framework conditions for the use of mobility management by regional public transport administrations in Sweden existed and could be enhanced on a national scale.

Interviews were conducted with key informed actors in the Swedish system for supporting the provision of public transport, with the organisations that actually procure public transport, and with cases internationally where public transport administrations are engaging with mobility management. The PAIRs scheme from MOST was used as a tool to characterise the framework conditions, and determine lacunae in support and potential leverage points.

Lacunae were determined to be: lack of political will, lack of long term financial stability, lack of adequate staffing, lack of supportive legal structures, lack of quality assurance, general lack of awareness, and the constraint on relationships of public sector actors.

Leverage points were determined to be: the autonomous nature of actors, the legislative framework which is already in place at a national level, engagement and education not only through PTA networks but also with kommuner and organisations coordinating infrastructure, personal economics when choosing a transport mode, and the integration of technology which is already a strength of PTAs and could be capitalised on to work on other areas.

Recommendations were based on using these leverage points to ameliorate the conditions, and fill the lacunae, for engagement with mobility management by public transport administrations.

**Keywords: Sweden, Mobility Management, Public Transport Governance, Doubling Goal, Fossil Free**

# Executive Summary

In Sweden, in 2012 33% of total greenhouse gases emitted came from the transport sector (Naturvårdsverket, 2014). To reduce this, the Government Bill 2001/02:20 has specified, under the heading of Sustainable Travel, that modal choice should be shifted from the passenger car to more environmentally sustainable transportation options such as public transport, cycling, and walking (SWEPOMM, 2015a). Mobility management aims to change attitudes and behaviours to shift modal choice of individuals in exactly that way. Many different actors have engaged with mobility management to respond to the legislation, achieve strategic environmental goals, and reduce the greenhouse gases emitted by their transportation systems. However, Public Transport Administrations (hereafter referred to as PTAs) have only been included in these projects as a partner, they have not been the focus of or leaders on initiatives (MOST, 2003; Dickinson, et al., 2012, Brandt & Arnfalk, 2012; IIIEE, 2011; Trivector, 2015; Kepaptsoglou et al., 2012).

This thesis aimed to investigate whether Swedish PTAs could engage with mobility management as an initiator of projects, instead of a mere partner.

The following research questions were used to guide the study conducted:

1. To what extent is mobility management used today by public transport authorities, or administrations?
2. Do supportive conditions exist for engagement with mobility management in Sweden by public transport administrations?
3. How can supportive conditions for engagement with mobility management be improved for Swedish public transport administrations?

Services offered as part of mobility management may include, but are not limited to: Information and Advice, Consulting, Awareness, Transport Organisation and Co-ordination, and Sales and Reservation of Transport Related Products. Many of these services already fall into the jurisdiction of PTAs in Sweden.

The primary method of data collection was to conduct interviews with key informed actors in administrations in charge of procuring public transport locally in Sweden, organisations supporting or interacting with those actually procuring the transport, and administrations outside of Sweden which have successfully engaged with mobility management. The 29 interviews were supported by a desktop study. The PAIRs scheme was used as a framework for illustrating the supportive conditions in question.

The Swedish system for providing public transport has involved, and received support from many different actors. Figure I shows the actors discussed in this study, and their relationship to each other. It was found that none of the national actors were encouraging PTAs to engage specifically with mobility management.
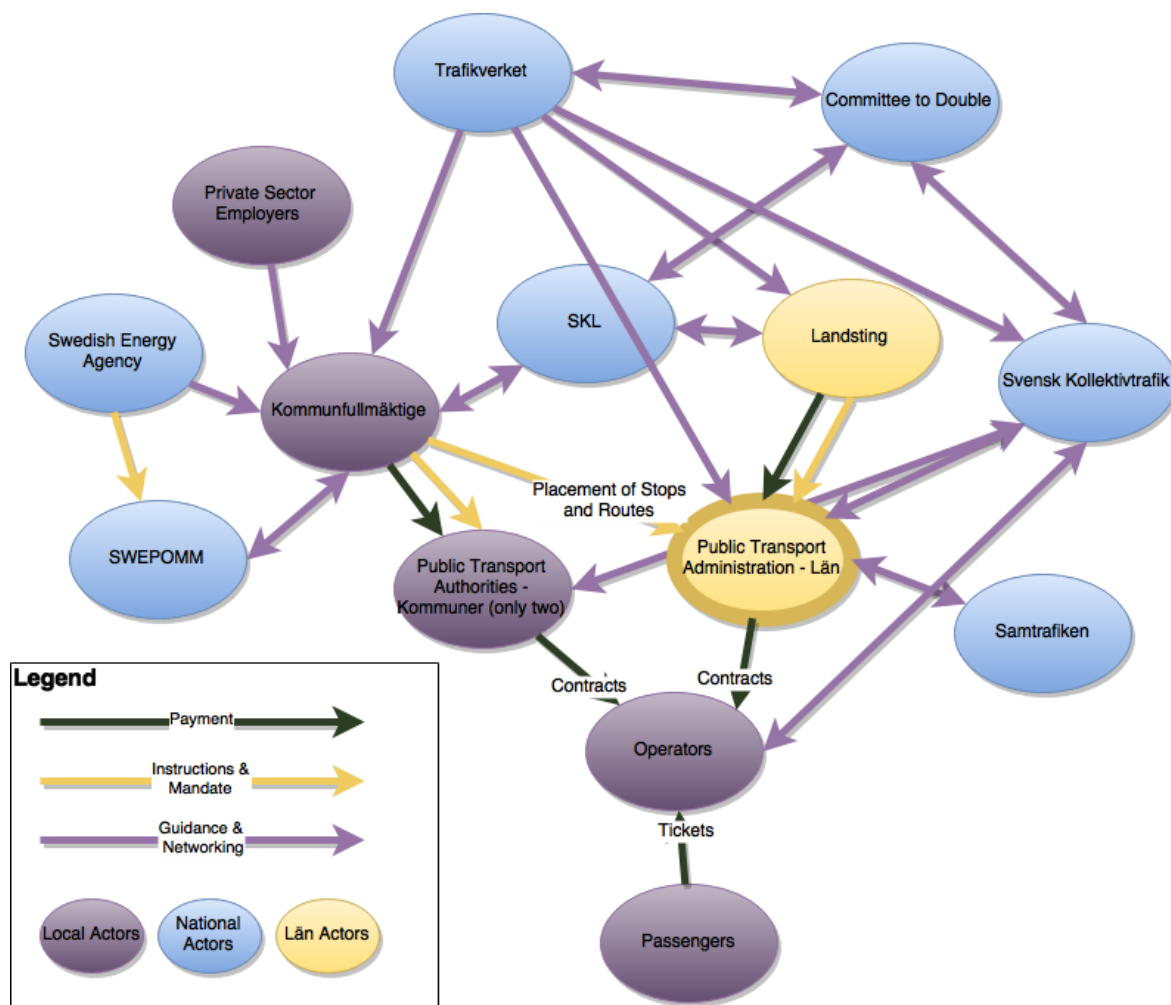
*Figure I Overview of interview results characterising the Swedish system for providing public transport, including actors on the national, local, and län level.*

When Swedish PTAs were interviewed it was found that support is lacking in all domains of the PAIRs framework. It is also clear that this has not prevented PTAs from engaging with mobility management, but may have limited that engagement significantly.

When key informed actors in successful international cases were interviewed it was found that despite their successful engagement with mobility management, the interviewees identified several domains in which they were neither well nor consistently supported. Each PTA was supported in a way which was appropriate for their conditions, or was able to leverage the support they received to create favourable conditions for themselves.

The study was able to respond to each of the research questions.

Engagement of PTAs with mobility management was found to be limited. It is considered an interesting finding that the Swedish case of low-engagement does not appear to be unique. Instances of PTAs engaging with mobility management were difficult to identify internationally, only four were found for interviews.

According to the analysis based on the PAIRs scheme some of the supporting conditions required for PTAs to engage with mobility management were in place in Sweden, however there were many gaps. The following were identified from the perspective of Swedish PTAs:

Lacunae were determined to be: lack of political will, lack of long term financial stability, lack of adequate staffing, lack of supportive legal structures, lack of quality assurance, general lack of awareness, and the constraint on relationships of public sector actors.

Leverage points: the autonomous nature of actors, the legislative framework which was already in place at a national level, engagement and education not only through PTA networks but also with kommuner and organisations coordinating infrastructure, personal economics when choosing a transport mode, and that the integration of technology was already a strength of PTAs and could be capitalised on to work on other areas.

Multiple actors in Sweden were identified as being able to facilitate the engagement of PTAs with mobility management. Actors in the Swedish context must use the identified leverage points to fill the lacunae in support.

Recommendations were developed based on the analysis in the entirety of the thesis. They were developed as a supplement to the response to the third research question.

Recommendations for national organisations were: that specific planning and coordination efforts, such as joint strategic goals, or co-writing of policies, be undertaken; that national networks feature a seminar or complete conference on mobility management; that The Swedish Platform on Mobility Management open up to actors from the PTAs; that a comprehensive strategic plan be developed to achieve the goal to double public transport boardings; that mobility management be formally recognised as part of the goal to double public transport boardings; that Trafikverket's new process of roundtable discussions incorporate mobility management and PTAs; that Swedish organisations use their existing networks to promote networking amongst rural areas, by providing sessions tailored to their operating conditions; and that controversial issues must be addressed and differences must be overcome through collaboration.

Recommendations for PTAs were: that quality assurance and management techniques be adopted; that PTAs communicate with each other on a national level; that inter-regional transport can be encouraged through coordination to open up potential partnerships and new passengers who are crossing geographic borders; that the current success with implementation of technology in information and communication must be capitalised on to optimise system operations; mobility management be recognised by PTAs as a way to increase boardings; and that PTAs recognise mobility management projects as projects with high benefit to cost ratio.

Recommendations for other actors were: that they must include PTAs in planning and coordination, and that if they open up the tender process to other modes they will shift the paradigm of what public transport is and what alternatives are available.

It was observed that public transport could play an important role in helping Sweden to honour its international commitments. However, for PTAs to reach their maximum potential, the conditions for engagement would need to be improved. The enormous potential of PTAs must be harnessed, or else they will simply become another missed connection.

# Table of Contents

## List of Figures

# List of Tables

# Abbreviations

$CO_2$-eq - $CO_2$-equivalents

DRT – Demand Responsive Transport

ECOMM – European Conference on Mobility Management

EEA – European Environment Agency

EPOMM – European Platform on Mobility Management

EU – European Union

GTHA – Greater Toronto and Hamilton Area

IIIEE – International Institute for Industrial Environmental Economics

MAX – Successful Travel Awareness Campaigns and Mobility Management Strategies

MFD - Myndigheten För Delaktighet

MOMENTUM – Mobility Management for the Urban Environment

MOSAIC – Mobility Management Applications in the Community

MOST – Mobility Management Strategies for the Next Decades

OHCC – Ontario Healthy Communities Coalition

PAIR – Policy, Actors & Structures, Integration, Resources (Basic Conditions, Inverse Policies)

PTA – Public Transport Administration

SEA – Swedish Energy Agency

SKL/SALAR Sveriges Kommuner och Landsting/Swedish Association of Local Authorities and Regions

SUMP – Sustainable Urban Mobility Plan

SWEPOMM – Swedish Platform on Mobility Management

UITP – International Association of Public Transport

# 1 Introduction

The global transportation sector is a major source of current and historic emissions of greenhouse gases. The emissions from this global sector have grown more rapidly than in other energy using sectors (Sims, et al., 2014).

The European Union (EU) has made strong commitments to reduce its greenhouse gas emissions (measured in units of $CO_2$-equivalents ($CO_2$-eq)) as part of a global effort to mitigate the devastating effects of climate change (EAA, 2015). The EU targets for the year 2030 aim to reduce total greenhouse gas emissions by 30% with respect to 1990 levels (European Commission, 2015). Within Europe, the transport sector is the only major sector which did not decrease its greenhouse gas emissions over the period from 1990 to 2012 (EEA, 2015). Though it should be noted that the reporting period ended with a downward trend in emissions (Eurostat, 2015).

Sweden as part of the EU must honour the targets set for 2030. Sweden has not yet achieved the previously established targets for 2020 for greenhouse gas emissions outside of the EU emissions trading scheme (Eurostat, 2015). Therefore further reductions will need to be orchestrated.

In Sweden, in 2012 33% of total greenhouse gases emitted came from the transport sector (Naturvårdsverket, 2014). Emissions from the Swedish transport sector were almost down to 1990 levels, as seen in Figure 1-1, which is nearly at their target for that sector for that time period.

Sweden is working to continue to achieve its commitments and visionary goals, in a variety of ways as appropriate for each sector. For the transport sector, the Environment and Energy Department has developed a plan to remove the use of fossil fuels from its roadways, by the year 2030, through the promotion of walking, cycling, and public transport (Utredningen om fossilfri fordonstrafik, 2013). This shift is targeted because, as Figure 1-1 clearly shows, the majority of passenger transport emissions are coming from passenger car travel.
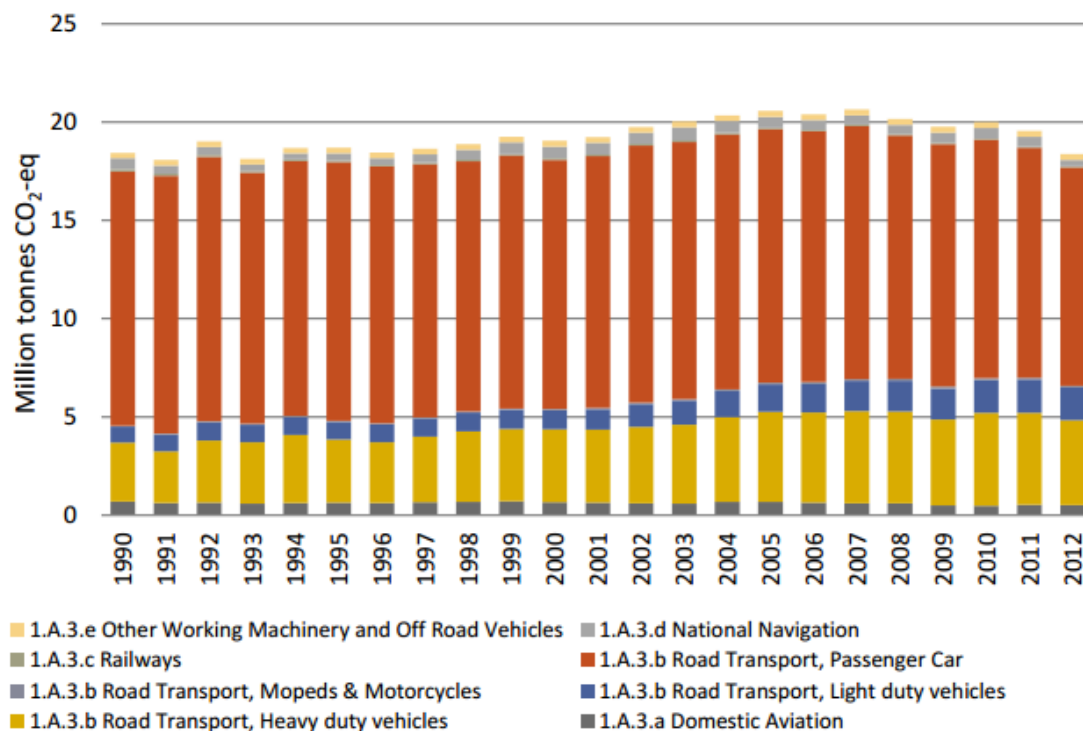
*Figure 1-1 Shows the annual $CO_2$-eq emissions from different modes of transport in Sweden during the years 1990-2012. The figure demonstrates the importance of passenger car travel in the greenhouse gas emissions from Sweden*

*Source: Reprinted from Naturvårdsverket, (2014)*

The Swedish transportation committee had set a goal to double the market share of public transport from the 2006 baseline by 2020 (Trafikutskottets betänkande 2014/15:TU13). The goal has support from all parties in parliament, and aims to shift transportation from cars to other more sustainable transportation options. This will likely mean large investments in public transport infrastructure, and reduced investments increasing road capacity (Sundström, 2015). The doubling goal (hereafter referred to as "The Goal") has resulted in the formation of a multi-organisational committee to support efforts and promote good examples. The Goal is alive in the industry, however the committee has shifted focus to improving public transport, instead of focusing on statistics and numbers of passengers (ULO, 2014).

Sweden's public transport is organised and provided on the Län level. The term län translates loosely to the term in English "County". It is the level of government between the Swedish National level and the Kommun (Municipal) or Stad (City) levels. A Swedish län is generally larger in size than a municipality, but smaller than a state or province. Län have limited responsibilities as the EU principle of subsidiarity pushes all possible decisions down to the lowest level, which, in Sweden, would be a stad (city) or kommun (municipality) depending upon the local structure. There are 21 län in Sweden, and each is their own public authority with regards to public transport. Each authority has set up an administration, which is owned and financed by the län which it serves. All of these Public Transport Administrations (hereafter referred to as PTAs) are welcome to participate in working towards The Goal. As of 30th of June, 2015: thirteen län have officially mentioned The Goal in their planning, seven of which have officially adopted it (SWECO, 2015).

The Government Bill 2001/02:20 has specified, under the heading of Sustainable Travel, that modal choice should be shifted from the passenger car to more sustainable transportation options such as public transport, cycling, and walking (SWEPOMM, 2015a). This directly supports all actors engaging with concepts such as mobility management which target demand for sustainable transportation as opposed to supply of services and infrastructure. The bill goes on to mention mobility management explicitly.

To achieve all of these ambitious goals, public transport has already been named in strategic plans, and will continue to be a part of solutions. Any significant investment in technology or infrastructure must be accompanied by measures ensuring that it will be used, such as mobility management, and that the investment of public funds has been well spent (SWEPOMM, 2015a).

## 1.1 Problem Definition

Kommuner and the Swedish National Government have been promoting sustainable transport in Sweden. Their actions and plans use the concept of mobility management, as well as infrastructure investments. However the PTAs who are responsible for the procurement of public transport in Sweden, have had limited visible engagement with this concept.

PTAs have only been included in mobility management discussions as a partner, they have not been the focus of projects or leaders on initiatives (MOST, 2003; Dickinson, et al., 2012, Brandt & Arnfalk, 2012; IIIEE, 2011; Trivector, 2015; Kepaptsoglou et al., 2012). This thesis aims to investigate if PTAs could engage with mobility management as an initiator of projects. Mobility management is a concept which has greatly benefited many actors in the Swedish system, and internationally. PTAs are likely missing out on great opportunities by not utilising the concept.

Therefore, the purpose of this thesis is to determine if the conditions in Sweden are supportive for the use of mobility management by PTAs, and if they can further be enhanced on a national scale.

## 1.2 Research Questions

The following research questions were used to guide the study conducted:

1. To what extent is mobility management used today by public transport authorities, or administrations?
2. Do supportive conditions exist for engagement with mobility management in Sweden by public transport administrations?
3. How can supportive conditions for engagement with mobility management be improved for Swedish public transport administrations?

These questions were designed to establish current state of engagement with mobility management both in Sweden and abroad, characterise the current landscape of conditions and support for PTAs in Sweden, and identify opportunities for action, based on the previous questions. The responses will build upon each other to provide robust recommendations to support an increase in the utilisation of mobility management by PTAs, as appropriate.

## 1.3 Scope and Limitations

The scope of the study is to investigate the conditions for engagement with the mobility management concept from the perspective of Swedish PTAs. This includes organisational and contextual factors appropriate for the Swedish case. Actual engagement with mobility management has been included, but has not received in-depth assessment. There is limited inclusion of physical infrastructure, socio-demographic statistics for the passengers, or historical

factors. The scope is largely matched to the theoretical framework chosen, and the mandate of PTAs in Sweden.

Whether public transport is the least environmentally damaging mode of transport and other potential societal benefits or harms, are not considered. This study is conducted under the pretence of supporting mobility in general, the consideration of ways to avoid or reduce journeys falls outside of the scope of this study. Mobility management is a concept which includes all modes of transportation, however only public transport is considered in this thesis. Other modes, such as cycling or carpooling, may be mentioned, however they are not the focus, and are only included in support or as part of the promotion of the mode of interest.

Limitations are covered in more detail as they arise in the study. General limitations include the size of the study and the limited time and resources available to the author. These factors have directly limited the number of interviews conducted. The timing of the study has greatly limited the availability of potential interviewees and has potentially led to initial candidates having to refuse the interview as happened with Skånetrafiken and Västtrafik. While interviews were conducted with both of those organisations, each interviewee mentioned that the author should be talking to a different person within the organisation. Any possibility of differences of opinions within PTAs has not been explored. Due to the nature of the subject studied, interviewees did not always understand or relate their actions to the concept, and so gave unclear or mixed answers. The author is a native English speaker, and her grasp of Swedish is incredibly limited, thus language barriers may have played a more significant role than she is able to be aware of.

## 1.4  Ethical Considerations

The author did not identify any ethical issues inherent in the study undertaken. Only one participant came into direct contact with the researcher, and no personal or private data or information was collected from any participant. The author made clear the intention of the study, and use of the interview results to each interviewee, and thus considers that she received informed consent according to recommendations in Kvale and Brinkmann (2009). There are no guidelines given out by Lund University in English (Lund University, 2009) against which the author could use to check her own understanding.

## 1.5  Audience

The intended audience of this thesis is regional and multi-regional public actors, such as regional public transport administrations, regional governmental bodies or authorities, and national governmental authorities. Specifically Samtrafiken is targeted as the audience because mobility management has recently come into their mandate. Samtrafiken is considered to be an interested party in this study, and have been represented by one member of the supervisory committee (of which there are three members total). Actors operating in other multi-regional levels, such as private sector employers, may also be interested.

## 1.6  Disposition

Chapter 1 has summarised the problem background and definition, and elaborated upon several aspects of the thesis. It has presented the research questions, scope and limitations, ethical considerations, and audience targeted.

Chapter 2 will explain the logic and principles guiding the study, and elaborate upon the steps taken to develop the findings. It will also elaborate on the chosen theoretical framework.

Chapter 3 will elaborate on the concept of mobility management, common services provided as part of mobility management projects, and explain the benefits of its utilisation.

Chapter 4 will characterise the Swedish system for providing public transport. It will use findings from interviews with key informed actors, and be accompanied by a desktop study characterising the complex interactions. Particular attention will be paid to their supportive role of PTAs, and to their current engagement with mobility management or future interest in the concept.

Chapter 5 will present the findings from the investigation into the framework conditions for the engagement with mobility management under two circumstances. First the findings from PTAs in Sweden will be presented. They will be followed by findings from international contexts where PTAs are successfully using mobility management as part of their activities. Finally the two will be compared. Findings will be organised in accordance with the PAIRs scheme, elaborated upon in section 2.1. This chapter will include the response to the first research question.

Chapter 6 will bring the findings from the findings characterising the Swedish system for providing public transport, together with the findings determining the framework conditions for Swedish PTAs, chapter 4 and section 5.1 respectively. They will be juxtaposed with the PAIRs scheme framework, as explained in section 2.1, and analysed to identify lacunae (section 6.7.1) in the support of and leverage points (section 6.7.2) to increase the engagement with mobility management. This chapter will include the response to the second as well as the third, and final, research question.

Chapter 7 will present the response to each research question, recommendations that are developed based on the analysis in the entirety of the thesis, and concluding remarks. Recommendations will be divided by actor for the clarity of the reader. Their intention will be to facilitate the enhancement of the conditions for PTAs to engage with all aspects of mobility management.

# 2  Methodology

The purpose of this chapter is to explain the logic and principles guiding the study, and to elaborate upon the steps taken to develop the findings.

The primary method of data collection was to conduct interviews with key informed actors in a variety of positions either within the Swedish system or involved in programmes that successfully implemented mobility management in other countries. The 29 interviews were supported by a desktop study, and occasional communication in writing where clarification was required or time did not allow for an interview. The findings from both the desktop study and interviews are presented together. The author felt that the source of information was less relevant than the insight drawn from it.

## 2.1  Theoretical Framework

The PAIRs scheme from MOST (2003) was chosen as a theoretical framework to guide the collection of data, focus of writing, and analysis. The scheme is one of the main outcomes of the MOST project analysis. It is designed to guide policy makers to detect the most important barriers and support structures for mobility management in their jurisdiction of governance, be it a municipality, region, or an entire state. It characterises the conditions in which PTAs are operating, while emphasising the necessary components for engagement with the mobility management concept. It fits the scope seamlessly as it identifies the key conditions and success factors for engagement with mobility management.

The PAIRs scheme has six domains as shown in Figure 2-1, four that have a direct influence on projects and organisations and two whose influence on success is more indirect, shown in blue and yellow, respectively. Direct influences are: Policy, Actors & Structures, Integration, Resources. Indirect influences are: Basic Conditions, Inverse Policies.
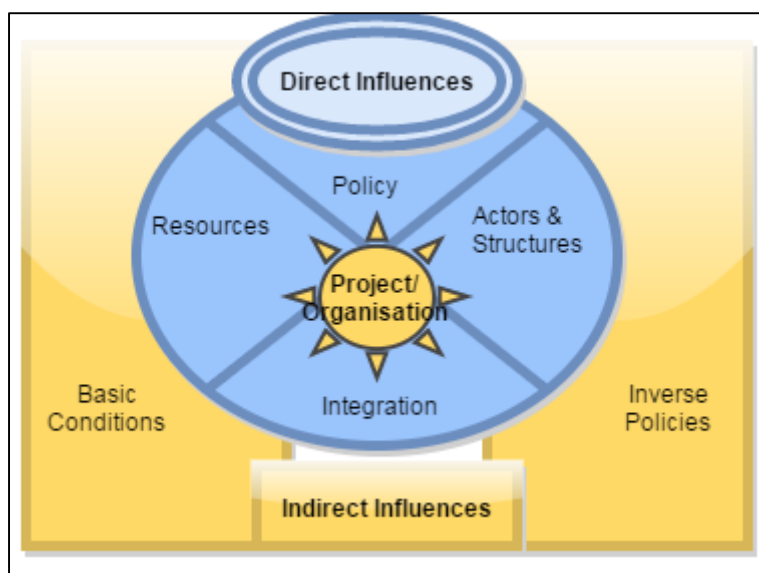


*Figure 2-1 Visualisation of the supportive conditions of the PAIRs scheme*

### 2.1.1  Direct Influences

These four domains are readily manipulated and fall directly under the jurisdiction of the public sector. They are shown in blue in Figure 2-1, and are closest to the project to represent their direct nature of influence.

### Policy

Policy in this instance refers to legislation and actions plans. The scheme focuses on three aspects: guidance from higher levels such as the EU or national level, alignment of mentality with prevailing societal needs, and clear delineation of responsibilities between sectors.

Responsibilities may include, but are not limited to, the roles and mandates of each actor in each sector, the responsibilities of identifying issues or problems, dealing with identified issues, and installing or maintaining equipment as well as considering externalities.

### Actors & Structures

This domain focuses on the people involved and the channels through which they are able to act. The scheme focuses on six aspects: active individuals promoting mobility management as champions or anchor points, the existence of a cooperative and communicative governance structure, the consistency of approach, qualification of key personnel, embeddedness of mobility management into existing structures or the existence of a formal structure dedicated to mobility management, and cross-European exchange and cooperation.

The criteria and responsibilities of champions and anchor points are not explicitly defined in MOST (2003). Thus it has been considered to be any individual who has taken it upon themselves to promote and engage with mobility management whether or not they have the mandate to do so.

### Integration

This domain focuses on both the integration of concepts into mobility management and the integration of mobility management into other areas. The scheme includes five aspects: the inclusion of multi-modal trips in mobility management, the combination of "push and pull" measures in transport policy, including technology in mobility management thinking, integration of mobility management into land use-planning, and the integration of mobility management into non-transport related policy areas.

MOST (2003) does not explicitly define or include an all-encompassing list of push and pull measures. Therefore the author has drawn on her understanding of policy to consider that push measures are those that punish behaviour which is not desirable, and pull measures are those that reward behaviour that is. For the current study push measures might include limitations on parking, and pull measures might include discounted passes offered through an employer.

Integration is a key domain because it is not anticipated by MOST (2003) that mobility management on its own will sort out solutions to all transport related issues. The integration of the concept into other policy areas and the mind-sets of other actors will foster collaboration and cooperation, which will contribute to developing comprehensive and practical environmental sustainability solutions.

### Resources

Resources in this instance refers to both tangible and intangible items. The scheme includes five aspects: knowledge and research, long-term financing, information and guidance on implementation, use of quality standards and management techniques, and legal resources and support for engagement with mobility management.

Economic shifts, such as macro-economic crises or new taxation such as the Swedish Carbon Tax, were asked after under this domain.

### 2.1.2   Indirect Influences

These domains are not under the direct jurisdiction of any one actor.  Indirect influences are societal in nature, and permeate through the operations of both the public and private sectors. They are shown in yellow in Figure 2-1, and are placed underneath the domains which have a more direct influence to illustrate their nature as underlying conditions.

### *Basic Conditions*

This domain includes fundamental conditions which will provide a starting point for engagement with mobility management.  The scheme includes three aspects: a sufficient supply of high quality alternative modes of transportation, sustainable transport must be an overarching goal in approach and vision, and the mobility culture must be capable of supporting alternative modes to the passenger car.

### *Inverse Policies*

This domain reflects the importance of other policies.  If mobility management is engaged with, then it is important to review all policy and societal areas to ensure that there are not perverse incentives which will undermine or counteract efforts.  They may be contained in policy arenas very distant from transport such as taxation or education.

## 2.2  Interviews

Interviews were chosen over document searches or surveys, for a number of reasons. Interviews were able to be conducted in English, and not all documents were available in that language.  Interviewees were also able to expand upon interesting aspects of projects such as motivation, and stakeholder interaction and influences, which are not elaborated upon in official reports or in most standard survey responses.  The focus of the thesis is looking into the supporting conditions for mobility management in PTAs, and thus it was not anticipated that a strictly "from the desktop" study would provide insight into this somewhat abstract area.

Interview technique used was based on the author's previous experience, and guided by the handbook *Interviews: Learning the Craft of Qualitative Research Interviewing* by Kvale and Brinkmann (2009).  A complete list of interviewees and the date on which they were interviewed is in Appendix B.

29 Focused factual interviews were conducted over the phone, Skype, or in person.  The interviews were not recorded.  The author, a native English speaker, took diligent hand notes during the call, which allowed the use of meaning condensation analysis to begin already during the interview process, and maximised the limited resources available to the author.  Direct quotes are not used in this study.

The interviews were preceded by a limited literature review.  This was conducted to ensure that the topic choice was not a duplication of studies already available in literature, and to determine a framework for analysis of data.  The PAIRs scheme was relied on heavily during interviews because of this.

Interviews were based on the guide (in Appendix A) which was quite extensive. This was found to be advantageous in dealing with language barriers.  It was also useful in facilitating a complete explanation of the study to develop mutual understanding between the two parties regarding the interviewer's interests and intentions. The openness of the script varied depending on who was being interviewed.

Interviews were conducted based on the three types of findings in this study: characterisation of Swedish context, investigation of the län perspective, and lessons from successful cases.

### 2.2.1  Characterisation of Swedish Context

Five interviews were conducted with actors outside of public transport authorities in Sweden. Organisations targeted for interviews were based on the initial desktop study regarding provision of public transport in Sweden, as well as findings and recommendations from the PTAs interviewed.  There are more than five organisational actors involved in public transport provision in Sweden, however the timing of the study, and resources available to the author, limited her ability to schedule interviews with more.  It was found that within the Swedish system, many organisations were well informed of the mentality and operations of other organisations, and so this limitation is not considered to be significant in this instance.

Actors in the Swedish context were interviewed with a very open interpretation of the script in the interview guide.  This was done to adjust the guide appropriately for each actor, and extract the maximum amount of meaning from the interviewee in relation to the PAIRs scheme.

### 2.2.2  Investigation of PTA Perspective

Eighteen interviews were conducted with PTAs, or with another appropriate actor from the län's administration if someone from the PTA was unavailable.  The eighteen interviews covered one kommun operated, and seventeen län operated PTAs.  Geographical coverage of interviews is shown in Figure 2-2 in blue, and those areas missed are shown in yellow.  Interviewees were contacted based on the membership list available from Svensk Kollektivtrafik (2015b), which was cross referenced against the survey list from Myndigheten För Delaktighet (MFD) (2015). Initial contact was made via email, follow ups were conducted over the phone to gather contacts who did not respond to initial attempts.

AB: Stockholm County
AC: Västerbotten County
BD: Norrbotten County
C: Uppsala County
D: Södermanland County
E: Östergötland County
F: Jönköping County
G: Kronoberg County
H: Kalmar County
I: Gotland County
K: Blekinge County
M: Skåne County
N: Halland County
O: Västra Götaland County
S: Värmland County
T: Örebro County
U: Västmanland County
W: Dalarna County
X: Gävleborg County
Y: Västernorrland County
Z: Jämtland County

*Figure 2-2 Geographical coverage of PTAs interviewed within Sweden. Blue colouring denotes that a representative from the PTA serving that area was interviewed and included in the study.*

*Source: Adapted from Wikipedia (2015)*

As PTAs are not currently taking full advantage of mobility management concepts there was usually not an expert or one single appropriate person to interview. Therefore the individual in the position which best fit the scope of the thesis and the research questions was selected for inclusion in the research. This resulted in a large variety of internal perspectives being included in the interview findings. It is beyond the scope of this thesis to consider the opinion of different roles within PTAs, however it is here acknowledged that this has likely impacted the findings. Interviewees included: one Chief Executive Officer; one Public Transport Strategist; two Directors of Public Transport; four Planners of Traffic, Timetables and Routes, or Infrastructure; five Managers of Infrastructure, Operations, Projects, or Communications related to Infrastructure; and five individuals in the Marketing or Advertising departments.

It was evident that this range of roles reflected the variety of positions with which the mobility management concepts can be associated, as well as the collaborative work style in the PTAs. While it is advantageous to have gathered these wide viewpoints, it also limits the quantifiable nature of the data. No interviewee was able to confidently answer all questions, and thus concrete quantitative data is inherently biased towards the range of interviewees as opposed to the range of framework conditions in Sweden.

The interview guide was based heavily on the PAIRs scheme. This was done to ensure that all components of the scheme were covered in the interviews. PTAs were interviewed in strict accordance with the script. While the content of the interview guide was strictly adhered to, the order of questioning was fluid depending on the answers given by the interviewee. The author attempted to include control questions, which would repeat similar themes from different angles, but this was difficult due to the frequent re-wording of questions and explanation of meanings required by her interviewees.

### 2.2.3   Lessons from Successful Cases

Lessons from successful cases were sought in international contexts. This was done for a number of reasons including the broadening of the view point on mobility management and of public transport, the assurance that the chosen framework would be illustrative of important factors for success or failure of engagement with mobility management, and to search for lessons from international cases potentially applicable in Sweden.

International success stories were sought out via the supervisor's experience, as well as researching case study databases of various conferences on mobility management and of organisations working to promote the concept. This included: ECOMM, EPOMM, CIVITAS, ELTIS, CUTA, TAC, JCOMM, TRB, ACT, and ViaejeoPLUS; a complete summary is in Appendix C List of Conferences Researched for International cases. Cases were determined to be successful if there was an increase in public transport boardings associated with measures aside from increasing or expanding physical infrastructure in which a regional public transport authority or administration engaged with mobility management. It is a limitation of the study that it is not possible to identify the direct causal link between mobility management and increased boardings.

Those cases found were contacted via email first to schedule a phone interview. It was found that there were not many to begin with and thus four were conducted to characterise the successful use of mobility management in a variety of scenarios. Two additional interviews were conducted with actors who were thought to be PTAs, but turned out not to be. Findings from these interviews, and from documents from other similar cases have been incorporated into broader contextualisation of the mobility management concept.

When interviewing actors in International PTAs the interview guide was used to provide a loose structure and ensure that all aspects of the framework were discussed. The strict use of it was not possible due to the difference in key terms used in different organisations. For example; outside of the EU, it was found that the definition for mobility management aligned with the term transportation demand management without obvious differences (Majumdar et al., 2012). Therefore the terms were interchanged depending on the vernacular of the actor being interviewed.

## 2.3  Analysis

Concept driven coding was used, based on the PAIRs scheme, to extract and interpret meaning derived from the interviews. Due to the language proficiency of many of those interviewed, no language interpretation was done, and no direct quotes were extracted. The PAIRs scheme guided all analysis.

Literature was reviewed both in the Swedish and global context to complement the findings from interviews. The European Platform on Mobility Management (EPOMM) was used extensively for this purpose, as was the Lund University library network. Documents found in Swedish were occasionally translated to English using google translate, but this tool's applicability is limited and thus this practice was limited. Sources of information that were

provided by their authors in already translated formats were sought out wherever possible. It should be noted that the desktop study was limited due to the concept's lack of uptake by the actors with which the study is concerned, as well as the tendency of organisations to translate only summaries of documents when their operational language is not English.

The PAIRs scheme was used to analyse and deduct the relationship of PTAs to the concept of mobility management. For the analysis of the Swedish context, the reasoning used was inductive due to the openness of the script used in interviews. The focus was on lacunae in supportive structures and potential sources of leverage. Sources of leverage, or leverage points, were identified based on being an aspect which was performing well, a domain in which support was particularly strong, or an aspect in which a small shift could have a large impact on the system as described by Meadows (2011). International interviews were analysed deductively based on the same framework to align the findings with those from Sweden. It was less instrumental than when investigating the provision of public transport in Sweden, but was instructive nonetheless.

# 3  Mobility Management

The purpose of this chapter is to elaborate on the concept of mobility management, common services provided as part of mobility management projects, and to explain the benefits of engaging with it.

## 3.1  Mobility Management Definition and Brief Development Context

The definition of mobility management shifts across disciplines and geography. For the purpose of this thesis, the definition used is that developed and approved by EPOMM and the MAX consortium. According to MAX, the definition is open, is not all-inclusive, but strives to be refined at EPOMM activities. The definition is as follows:

> *Mobility Management is a concept to promote sustainable transport and manage the demand for car use by changing travellers' attitudes and behaviour. At the core of Mobility Management are "soft" measures like information and communication, organising services and coordinating activities of different partners. "Soft" measures most often enhance the effectiveness of "hard" measures within urban transport (e.g., new tram lines, new roads and new bike lanes). Mobility Management measures (in comparison to "hard" measures) do not necessarily require large financial investments and may have a high benefit-cost ratio. (EPOMM, 2015, para 2)*

This definition is chosen to align this study with the EU documentation, the work with the outside partners as well as the chosen framework for analysis of results.

Outside of the EU, mobility management is often referred to as transportation demand management. It was found through literature and interviews that the two terms overlap seamlessly. It was also found through literature and confirmed in interviews that there are several small scale actors providing resources similar to EPOMM; they are online databases such as the Online Transportation Demand Management Encyclopedia managed by the Victoria Policy Institute, and conferences such as Association for Commuter Transportation, and American Public Transportation Association. However, there lacks an institution of similar calibre and reach to the EU backing the concept.

The concept, and group of professionals furthering its diffusion, appears to be less robust and centralised outside of the EU. Much of the work with mobility is focused on those who for reasons such as age, physical ability, or personal finances do not have access to car transport and so are dependent on public transport (Majumdar, et al., 2013; L. Tolentino, personal communication, 14 July, 2015). This has forced health actors to take a role as champions for programmes to ensure the wellbeing of patients and their ability to arrive on time to non-emergency appointments.

### 3.1.1  EU Projects

There have been several EU projects which have aimed to form and foster mobility management techniques, expertise, and knowledge by providing guidance as well as a platform for exchange and collaboration.

Initial EU projects such as MOSAIC and MOMENTUM, appear to have focused on maximising use of existing infrastructure. As EU and local projects have evolved, the focus has shifted to the integration of techniques into land use planning, and advancement of multi-modal transportation such as in MOST and MAX. Inclusion of a variety of stakeholders in collaborative projects has been a common theme in all mobility management reports and initiatives. Only MOST is discussed further as it is the most applicable to the scope of this thesis and has provided the framework for this study, the PAIRs scheme.

### MOST

The MOST (Mobility Management Strategies for the Next Decades) project, that took place from January 2000 until December 2012, was a comprehensive investigation into mobility management in the EU. It established that mobility management could be successfully utilise by levels of governance that stretch beyond the site specific level, and for time spans that reach into the horizons of long-term planning. MOST emphasised that mobility management could be used to increase dialogue among stakeholders. As long as flexibility is maintained in the lens used to view the tools developed, the concept can be used to engage with new arenas. This might include engagement with different sectors traditionally outside of the transportation sector such as Tourism or Education, or investigating underlying policies to unearth perverse incentives for using the passenger car.

MOST also established the need for evaluation of mobility management projects, as quality and impact were previously largely unreported. This lack of robust assessment has been a significant barrier to determining the appropriateness of mobility management for different situations.

The PAIRs scheme, elaborated upon in section 2.1, was born out of the framework analysis in MOST (2003). It is part of the recommendations and was designed to guide policy makers towards the most important influences on mobility management.

### EPOMM

EPOMM is an ongoing platform for the development and promotion of mobility management in Europe. It accomplishes this in a number of ways, including, but not limited to, the provision of tools, resources, modal split data, and forums. All information, resources, and contacts are available through the website (www.epomm.eu). Thus mobility management is, in theory, available to anyone interested with an Internet connection. The resource was invaluable in searching for case studies, the desktop study, and for the author's general understanding.

## 3.2  Benefits of Mobility Management

MOST (2003) explains mobility management as a concept that focuses on improving organisation and information across sustainable transport modes and services.

If used effectively, mobility management can promote liveable communities, which grow in accordance with sustainable development goals (Majumdar et al., 2012). There are numerous examples of the concept being applied successfully in Sweden and in Europe. The following examples are not exhaustive or complete, they are merely intended to be illustrative of the potential of the concept to facilitate positive change.

Be Green Umeå used a variety of activities to promote and encourage the use of sustainable transportation options in the city. Aspects of the project focusing on transportation used methodology from the MAX project and evaluation tools available on the EPOMM website. They engaged primarily with information services, fostering competition amongst citizens, and promotion of intermodal transport. This resulted in a reduction in travel by passenger car, and an increase in all other modes in both leisure time and more necessary trips (Trivector, 2015a). The campaign didn't just focus on transportation, but included waste and energy as well. The complete campaign reached a quarter of residents, and contributed to a reduction in car trips of 1 billion kilometres (Be Green Umeå, 2015).

Lund Kommun has been using mobility management as part of their strategy to create a liveable and safe city through the LundaMats plans (Lund, 2014). They have successfully promoted a

centre where the passenger car is the least convenient means of transportation (A. Söderberg, personal communication, 11 June 2015).

Malmö Stad used the campaign "no ridiculous car trips" to increase bicycle use by 20% between 1995 and 2010 (Goodyear, 2010). The campaign used information and demonstrations of the superiority of bicycles to passenger cars for short trips, as well as small incentives, such as seat covers, delivered to bicycle riders via their bikes.

Region Skåne has used mobility management to help achieve its goals for reduction of greenhouse gas emissions associated with travel for work (Trivector, 2014). This has included the provision of commuter passes, as well as increased information regarding travel options, but also options for avoiding unnecessary travel. This campaign included telecommuting and virtual meetings in place of travelling as it targeted travel for work.

The tourist sector in Madeira was able to promote public transport as an alternative to rental cars through hotels, and was able to reduce environmental pollutants such as greenhouse gases (Freitas, 2013). This was done through information and ticket sales offered at hotel reception desks willing to participate.

The Velo programme in Leuven, Belgium repaired and rented out bikes to students. The premise was simply that the provision of safe and legal bikes to students, who may not have the financial means to purchase their own, would lead to increased modal share of cycling through the supply of safe alternatives. In 2007 alone they successfully rented and repaired over 5 000 bikes, contributing to modal shift of students (Vandikkele, 2008).

### 3.2.1   Benefits for PTAs

Mobility management is a concept that promotes a modal shift away from the passenger car. Mobility management schemes and projects may benefit PTAs directly in a number of ways. The following are not meant to be exhaustive, but illustrative.

Information, communication, and stakeholder engagement may be used to increase boardings. Metrolinx was able to achieve a benefit to cost ratio of 6 to 1 through their smart commute programme (Smart Commute, 2015). Their programmes are tailored to commuters at each site, and focus on stakeholder engagement and information sharing to promote sustainable transportation. Benefits were both for the region, and for the PTA, for example reduced congestion benefits the community and helps increase the reliability of public transport.

Persuasive communication can be used to ensure that public transportation options are taken into consideration when selecting future housing, which affects pass purchases and boardings (Taniguchi et al., 2013). These projects are low cost, yet effective. Intermodality may fill in gaps in services offered by PTAs to reach more current residents (Majumdar et al., 2012), or promote its use by facilitating access for passengers living in sparsely populated areas. If a resident may take their bike on a bus, or leave it securely at the station, they may be more likely to consider public transport available in close proximity to their current location.

As transportation is an area that is constantly in flux in terms of technology and demands, it must be in continual improvement to ensure the delivery of appropriate supply (Kepaptsoglou et al., 2012). Utilisation of quality management techniques, partnerships, and multi-stakeholder engagement as in mobility management, will help to keep public transport offered in accordance with demand and the state of the art. Kim et al. (2013) confirmed that attitudes towards public transport are linked to awareness of environmental problems, behaviour intention is linked to the individual's attitude to public transport, and the final desirable step of actual behaviour

change is linked to the personal preferences for car use. Thus it is important to continually engage with stakeholders, including the public, to maintain a desirable image for public transport and shift individual preferences away from personal car use.

PTAs may also engage with mobility management to shift their services to accommodate more passengers. Without investing in major infrastructure upgrades, the City of Chilliwack, in British Columbia, Canada, was able to increase its ridership by 20% in both 2013 and 2014 from the previous year's levels. They did this through route rearrangement based on stakeholder consultations, integration of transportation and land-use planning, as well as route optimisation (R. Sanderson, personal communication, 12 June 2015).

## 3.3 Mobility Management Service Types

MOST (2003) identifies several service types which are important for successful engagement with the topic. Information and Advice, Consulting, Awareness, Transport Organisation and Co-ordination, and Sales and Reservation of Transport Related Products are the most common integral service components of mobility management schemes.

Depending upon the mode which is being targeted, actors offering the service, or targeted groups, each of these services may take on different characteristics and projects.

Information and advice includes broadcasting timetables for public transport services, informing residents of the availability and safe use of bike lanes, and advice on how to effectively set up a carpooling scheme. Screens available at bus stops showing updated time of arrivals with delays accounted for, and signage in the areas around bike lanes would both fall into this category.

Consulting goes a step beyond information and advice. It focuses on tailoring mobility solutions for a specific site such as a household or large company. The process includes an initial assessment, a detailed consideration of alternatives, and tailored recommendations.

Awareness includes any activity which raises the public's consciousness regarding transportation alternatives to the passenger car. Projects do not necessarily exclusively focus on awareness; a promotional week at a place of work may be born out of a consulting process and involve information services facilitating the setting up of a carpool. Social marketing initiatives, such as a summer photo contest which accompanies a special summer pass, would be included in this category and may also benefit other areas such as tourism, or arts and culture.

Transport Organisation and Coordination includes any activities which organise new forms of transport or coordinate existing forms to make services available in a new area or way. MOST (2003) emphasises the importance of this service at the site level. It may include the building of a new path to a bus stop, or providing a bike rack at a site where a bike lane enters the site. This may include Sustainable Urban Mobility Plans (SUMPs), providing organisation on a municipal level, which include partnerships and multi-stakeholder processes. This also includes promotion of multi-modal travel.

Sales and Reservation of Transport Related Products includes any activity which facilitates the purchase and security of transportation. This includes providing payment cards which work for multiple modes and across multiple regions. It also includes the ability to depend upon the availability of transport through booking or insurance.

Mobility management is most effective when used in combination with 'hard' measures. Pairing of demand side mobility management with supply side infrastructure investment, if done well,

will create a mutually enforcing loop (Brandt & Arnfalk, 2012; Tørnblad et al., 2014). This will enhance any measures to increase use of public transport as behaviour change will be encouraged and then rewarded.

## 3.4  Projects for Public Transport

Public transport is an important component of engagement with mobility management and the achievement of strategic environmental goals (MOST, 2003; Proposition 2001/02:20; Dickinson et al., 2012; Trivector, 2015; Majumdar et al., 2012). Its services and partnership are required as part of the provision of a variety of alternatives to the passenger car in any geographic area.

There are many projects and schemes which fall into the services detailed in section 3.3 which are logical for PTAs to engage with.

### 3.4.1   Information and Advice

This is the traditional service offered as part of daily operations of PTAs. Any broadcasting of information falls into this category of service. This includes the provision of applications for smartphones, placement of informative signs or maps at stops and stations, and provision of trip planners or information regarding connections and transfers.

### 3.4.2   Consulting

As consulting considers a range of alternative transportation modes, and public transport frequently is only considered to be one of those modes, this service is not logical for PTAs to offer. A review of transportation options would likely result in a very biased assessment report which would not serve the client or site.

### 3.4.3   Awareness

PTAs can contribute to awareness raising in a number of ways. Offering trial passes targeted at specific demographics or groups known to travel frequently by passenger car raises awareness in specific segments of the population. Umeå gave out trial passes, and saw an increase in public transport ridership in those who were given the trial passes (Trivector, 2015a). The profile of buses and stops on the landscape can also be considered to raise awareness as they can have a strong visible presence in an area.

It is difficult to determine and quantify the impact of projects on the awareness of any group of people or to understand the extent to which a project's impact spreads. Thus almost any activity which a PTA participates in may contribute to raising awareness of the scope of their services. However, its immeasurable nature is not an indication that raising awareness is not important.

### 3.4.4   Transport Organisation and Co-ordination

This type of service requires PTAs to engage in partnerships with other actors. As PTAs are limited by their mandate, they must engage with private sector actors, as well as other sources of transport in order to collaborate. Depending on the powers held by PTAs, they may be able to control where stops and stations are placed, or they may be at the mercy of their stakeholders. One aspect that PTAs can control is their engagement with other modes, specifically bicycles. Allowing bikes on public transport, without necessitating the purchase of an additional ticket, encourages passengers to incorporate other modes of transport into their journeys.

### 3.4.5  Sales and Reservation of Transport Related Products

This is another classic service which is logical for PTAs to provide. Most often this is done through the availability of different payment options such as a monthly pass, multi-use tickets, and the ability to purchase tickets which cross geo-political boundaries, modes, and operators.

Controlled tests conducted by Tørnblad et al. (2014) suggest that measures must be paired to be most effective. They incentivised with public transport passes, but were unsuccessful in changing ridership because of ample free parking available. Thus information should be paired with an incentive or disincentive which is tailored to the situation of the target group. The projects most likely to succeed will not fall into one of the above delineated project categories. This is common as many projects fall into multiple categories. For example; the Jojo Sommar card, provided by Skånetrafiken, is a single plastic card which fits easily into a credit card sized wallet slot and is decorated with bright colours and butterflies. It is valid on any service provided by Skånetrafiken between the 15th of June and the 15th of August. It was accompanied by a marketing and awareness campaign in similar colours and themes to that which decorated the card. The card itself is a classic example of sales of transport related products, which is useable on a wide network of coordinated and organised routes which serve several seasonal points of interest. It was accompanied by an awareness raising social media campaign involving an Instagram photo contest.

# 4 Characterisation of Swedish System for Providing Public Transport

This chapter aims to characterise the Swedish system for providing public transport. It uses findings from interviews with key informed actors, and an accompanying desktop study to characterise the complex interactions. Particular attention is paid to their supporting role of PTAs, and current engagement with mobility management, or future interest in the concept.

The Swedish system of providing public transport for its citizens requires several different groups of actors. Both private and public companies are involved in varying ways depending on the specific län and kommuner involved. There are several national organisations which support or impact the process. Figure 4-1 summarises the results of this chapter.
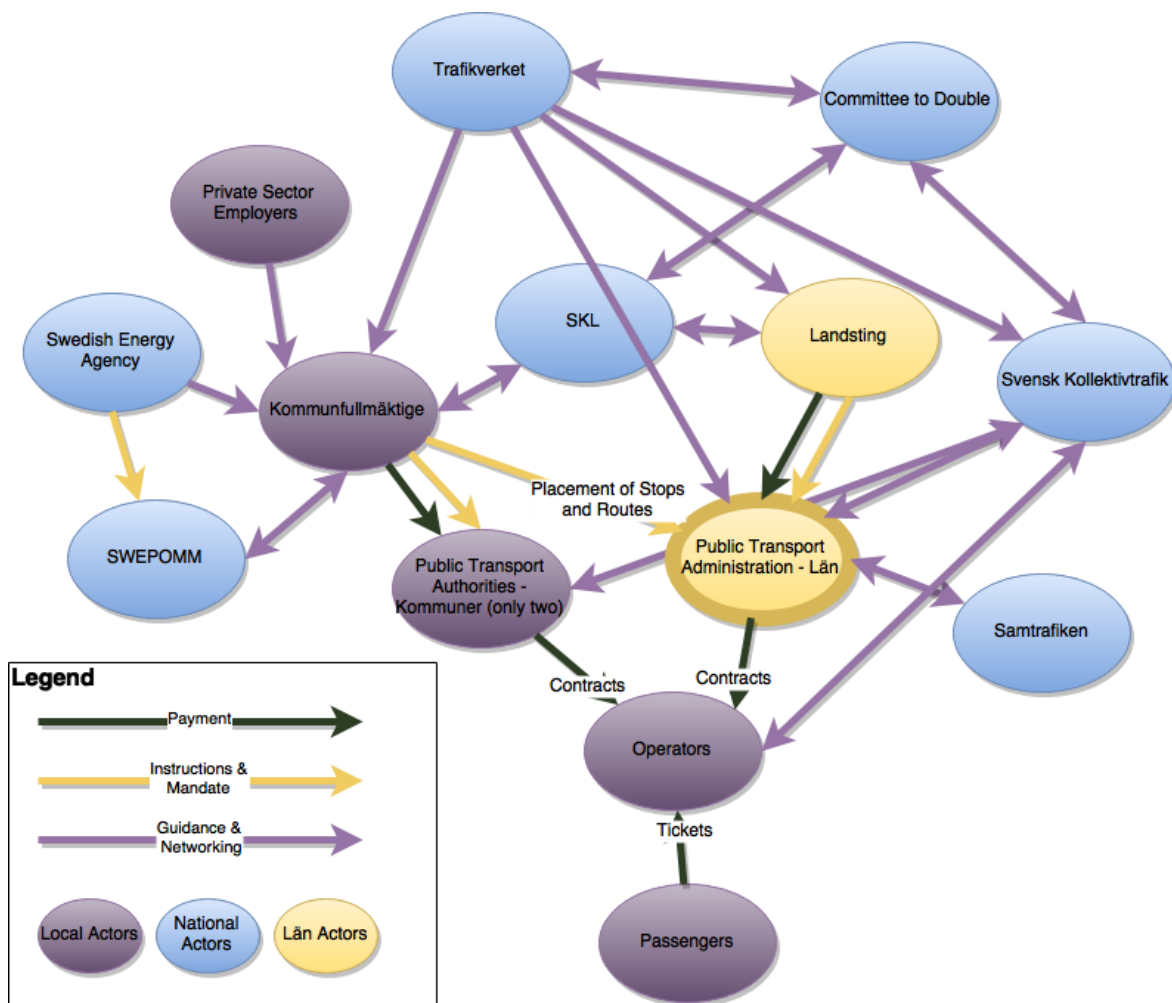


*Figure 4-1 Overview of interview results characterising the Swedish system for providing public transport, including actors on the national, local, and län level.*

It was found through interviews within the Swedish system that the private sector does not play an influential role in the Swedish context. The primary involvement of the private sector is as operators, or through relationships with kommuner. Major sources of employment do not influence PTAs. This is an interesting finding as site specific mobility plans, developed for private employers or business communities are considered a main driver for mobility management and public transport in other jurisdictions (R. De Tommasi, personal

communication, 16 June 2015 & M. Sadoway & N. Navarro, personal communication, 27 July 2015).

## 4.1 Län

The new Public Transport Act came into force on the first of January, 2012. This shifted the responsibility of organising and procuring Sweden's public transport to the län level. There are 21 in Sweden, and each is their own public authority theoretically in charge of strategic decision making, scope of transportation offered, long term goal specification, and coordination with other areas such as availability of transportation to places of employment and education (Svensk Kollektivtrafik, 2015c). Each authority has set up an administration (Länstrafiken (referred to as PTAs in this study)) to carry out their plan and responsibilities with regards to providing transport. The strength of the relationship between the landsting and PTA, and practical particulars of governance vary in each case depending on a number of factors.

Insight into the operations, and contextual realities of the administrations set up to procure public transport are presented in section 5.1.

### 4.1.1 Operators

The new Public Transport Act of 2012 allows private companies to answer the procurement activities of PTAs anywhere through a tendering process (Svensk Kollektivtrafik, 2015c). Operators are private companies who operate transportation as a part of the public transport system, and are the primary inclusion of the private sector in the system. They are not limited to a single mode, or geo-political region and can therefore have multiple contracts to provide service wherever they are awarded a contract through the public procurement process. This allows an element of free-market to enter into the public transport system, as it is up to operators to provide service at their least cost. Bus operators own their own equipment, but trains are owned by PTAs who only require private operators to run them. No comment was made regarding the normal ownership status of boats included in public transport. This is done so that the length of operator contracts matches the use phase of the lifecycle of the equipment. If the PTAs did not own their own trains, quality of train service would likely be significantly reduced as operators do not have access to the capital required to invest in safe and comfortable trains.

## 4.2 Kommuner

Kommuner (Swedish Municipalities) are able to control land use, and building permits, but cannot control personal choices. Kommunfullmäktige (Municipal Assemblies) engage with more stakeholders than do landsting, as seen in Figure 4-1. This is likely due to the principle of subsidiarity, which gives as much authority as reasonable to the lowest level.

Kommuner are able to respond to exactly the mobility culture in their specific context, and use infrastructure to promote specific means of travel. As an example, in Lund a conscious political decision to de-prioritise car traffic was taken several decades ago, therefore mobility management techniques have become necessary to support citizens' ability to transport themselves. The shift has been incrementally developed and supported by a series of SUMPs, backed by strong political will. The land-use planning process has successfully integrated mobility management in this context.

Kommuner have become a knowledge sink for mobility management techniques. This is both because they are best suited for its implementation given their political culture and available resources, and because they were first movers (Dickinson et al., 2012). All other actors simply backed off and didn't put resources towards mobility management projects, but instead

participated in the SUMPs put together for stads or kommuner. The private sector is simply focusing on other aspects of their operations, and other government bodies do not have the same resources or channels to engage with multiple actors (A. Söderberg, personal communication, 11 June 2015). This has led to inconsistent approaches and priorities amongst different groups, actors, and individuals.

The tools that are available to facilitate and support mobility management projects tend to be based on successful projects. Thus there is a strange enforcing feedback loop, as defined in Meadows (2011), where first movers are leading by example for others, but new stakeholder groups may not feel welcome or that there are tools or resources for them on platforms such as the Swedish Platform on Mobility Management (SWEPOMM) or EPOMM. Thus Kommuner and stad have been first movers in terms of mobility management, and will continue to be primary actors as the resources and tools are based on their examples, jurisdiction, and capabilities.

One major barrier to kommuner engaging with multi-modal transport is the protections placed on the payment systems. Anders Söderberg (personal communication, 11 June, 2015) described the difficulty he had in trying to use the payment card provided for the local PTA to pay for bike lockers, or a bike rental system for Lund. The PTA simply refused to open up the system, or to allow the kommun to share the money purse capabilities of the card. This despite the fact that the initiatives would likely encourage more people to use the PTA's services as the projects in question are located at their station. A second barrier is the lack of capacity for collaboration that exists in other organisations. A kommun may reach out to the PTA, or the private sector, but there is nobody on the other end to engage with. The PTAs are still undergoing significant growing pains from the organisational shift in 2012, and this has impacted their ability to deal with the politically taboo subject of mobility management.

### 4.2.1 PTAs Owned by Kommuner

Luleå and Karlstad have found a "loophole in the legislation" which allows them to procure their own public transport without involving or going through the landsting (A. Dyberg, personal communication, 8 June, 2015). They do not provide service to other areas within their län, only within their kommun boundaries. The operating conditions for these differ from the PTAs serving an entire län in that their geographical coverage is much reduced and is more evenly populated. Also different Kommunfullmäktige do not create competing requests within their borders. Their perspective has been included with the other PTAs (in section 5.1), as the services they offer are comparable to those PTAs owned by landsting.

### 4.2.2 SUMPS

A SUMP is a planning tool used by cities to balance a number of different interests and carve out a desirable mobility culture within their city (Wefering et al., 2014). This tool can help balance environmental, business, and residential concerns in any area by taking an integrated approach. Broadly, it aims to shift the dialogue surrounding transportation planning in cities by focusing on people and mobility, in an interdisciplinary environment with both short and long term planning horizons (Wefering et al., 2014). It can be used differently depending upon the state of mobility in of the city which is applying the principles and is often applied in stages and re-worked in an iterative process. The Lund SUMPs are in the LundaMats series, and have incorporated partnerships with private sector, the PTA, and public institutions targeting different groups and travel habits to varying degrees in each iteration. Each SUMP in the series targeted a different aspect, while building upon the results from the last iteration.

Because the kommuner are able to focus on local planning incorporating only one or a few stad, they are able to provide a platform for actors in close proximity to come together. They are

also able to bring multiple sectors into the same plan. When PTAs referred to the plans and power of kommuner, it was through SUMPs that they were acting.

## 4.3  Sveriges Kommuner och Landsting

Sveriges Kommuner och Landsting (SKL) translates to mean the Swedish Association of Local Authorities and Regions. It is an organisation which supports and advocates on behalf of kommuner, and län. This can include collective planning and collaboration within both the EU and national contexts (SKL, 2015). SKL does not directly impact public transport in Sweden, except to facilitate networking, collaboration, and knowledge exchange between different government bodies on a variety of issues. It may thus provide a platform where other networks have failed to. Membership is voluntary, and the primary goal of the organisation is to support self-governance by member organisations to maintain a close connection between citizens and decision makers (SKL, 2015). Its focus tends to be on supporting politicians instead of operational aspects (S. Sedin, personal communication, 13 July, 2015).

## 4.4  Svensk Kollektivtrafik

Svensk Kollektivtrafik is a national organisation for PTAs and operators. It lobbies on their behalf to national actors, and provides networking opportunities for its members. The function is that of support only as the membership is voluntary, as is participation in organised seminars, forums, and meetings. The organisation is financed by membership and event fees, and is run through a congress and a board comprised of elected officials from the membership. All Swedish PTA are members, despite that they are not being forced to participate.

The board of the organisation sets the priorities for networking and seminar events, and has not included mobility management as a priority. The push for mobility management has come from those with a public health mind-set which biases against car travel, according to Mattias Anderson (personal communication, 23 June, 2015). This should be a major advantage of the change in organisational structure in 2012 as now public health and public transport is handled by the same governance level. Current limited inclusion of mobility management in the organisation and member's activities is on a project by project basis, often tied to external funding. The mind-set for these types of networking or focus in events is simply non-existent within the organisation. Multi-modal, and other, initiatives will come when there is demand for them.

Significant barriers to mobility management adoption in the organisation, and in the membership, is that there are no good examples of it being successful on a scale equivalent to that of the membership's operations. It simply has not been demonstrated that mobility management could be used to increase the bottom line of PTAs (M. Anderson, personal communication 23 June 2015). Examples from the EU context are not useful or interesting to Svensk Kollektivtrafik as there are always significant differences in contextual factors. Often these differences are what have supported the implementation of mobility management, and therefore engaging within the EU context is not perceived to be a good use of time and resources as there are no lessons for Swedish organisations to learn from abroad.

Growing pains have been significant for PTAs, and so simply operating and grappling with new conditions has been enough work for them. This is what Svensk Kollektivtrafik has had to focus its support on since the organisational changes in 2012. Boardings are increasing rapidly on trains, but their operating costs are high, and their infrastructure needs updating, so they don't bring in significant profits for the PTA's. Previous tenders may not have reflected true costs of operation, and so since the organisational change, PTAs are simply not making the same level of profit.

Operational conditions for PTAs are slowly improving because their financial security is coming back, and growing pains are beginning to fade. Landsting can now turn to sources of new revenue and ways to operate. Mobility management can help match demand to supply, and that is the main opportunity in the eyes of Svensk Kollektivtrafik.

## 4.5 SWEPOMM

SWEPOMM is the Swedish Platform for Mobility Management. In theory it is the link between Sweden and EPOMM. It is supposed to provide support to all actors engaging with the mobility management concept and provide a strong network for them to learn from each other and spread knowledge and awareness of the practical benefits of projects (SWEPOMM, 2015b). The annual conference is attended primarily by staff from kommuner and stad, but other actors such as transport planners, consultants, private landlords and contractors are also represented. The conference is an annual event, held in Sweden to discuss mobility management. Interviewees stated that they were not aware of PTAs or other actors from län participating in the network.

SWEPOMM had been funded and supported by the Swedish Energy Agency, but the mandate and budget to do so has been lost. There was restructuring of national organisations and mobility management fell through the cracks, according to Adam Mickiewicz (personal communication, 10 June, 2015). The politically unsure times occurring at the national level over the past eight years have meant that, despite good results for all involved, the continued funding could not be justified. It is unsure who now funds the platform. A request for access, was made in June of 2015, but has not yet been answered.

## 4.6 Swedish Energy Agency

Mobility management in Sweden used to fall under the mandate of the Swedish Energy Agency (SEA), but was moved due to political shuffling. The local regions used to focus on mobility management, but now they focus more on infrastructure and capacity. What SEA is doing currently is funding the resilient municipalities programme, as well as specific projects which may be applicable on a national scale. Their focus is on facilitating networking and sharing so that other actors who may actually be able to implement mobility management have the knowledge and skills to do so.

Planning hasn't been a significant push mechanism for sustainable transport, and so there also hasn't been a huge pull for supply. SEA is trying to influence the built environment before it is constructed. It is easier to build a better engine in a passenger car, than to change a built environment and alter people's habits once they are constructed. SEA focuses on kommuner as they have the political mandate to move forward with mobility management. They also have both their own resources and access to support and resources from others. Kommunfullmäktige, in Figure 4-1, have connections to many actors which landsting do not. This is because they are a hub of communication and planning in both the private and public sectors, thus a national agency may reach a variety of different actors through programmes at the kommun level. This coordination is important because multi-modality is the way forward from the perspective of SEA.

Transportation will always be controversial, in all jurisdictions, and mobility management loses out because of that. The potential for connections, knowledge sharing, and ultimately making significant reductions in the amount of energy used to move people around exist, but without the political will, it is all a moot point.

There is little communication and collaboration between the SEA and the other national agencies. They receive very strong top down direction, but bottom up and sideways communications are limited due to a lack of mandate or ability to act based on the interactions. On the national scale the politicians need to specify budget, responsibilities and mandates among the different actors. The regions have no national body to turn to for knowledge and support. Currently there is little cohesion or collaboration between different actors. There is, however, no strong political will to push mobility management, as there is a lack of awareness of the benefits and opportunities (A. Mickiewicz, personal communication, 10 June, 2015; S. Sedin, personal communication, 13th of July 2015).

## 4.7  Samtrafiken

Samtrafiken is the national body which gathers and standardises ticket and timetable information among different PTAs. It also offers services to PTAs for information and dialogue (Samtrafiken, 2013a). The word "Samtrafiken" translates into English as Interconnection.

Their primary mission is to make transport easier, more accessible, and more reliable (Samtrafiken, 2013b). This includes both the provision of IT solutions aimed at passengers, and supportive mechanisms and systems for operators and procurers of public transport.

In May of 2015 Samtrafiken had mobility management forced into its mandate because of the dissolution of the company X2AB, and subsequent absorption of its projects into Samtrafiken's portfolio. The company X2AB had been formed as a result of the organisational shifts in 2012 to support PTAs in their new role to support The Goal. The company was born out of Svensk Kollektivtrafik initially. It was taken over by Samtrafiken because of its activities with common ticketing and for financial reasons. Thus mobility management has been pushed into the mandate of Samtrafiken as it was part of that of X2AB (S. Sedin, personal communication, 13th of July 2015; E. Arnestrand, personal communication, 4th of June, 2015). Svensk Kollektivtrafik is expecting to receive back a few of the projects from Samtrafiken as they are sorted through and divided amongst the appropriate national bodies.

## 4.8  Trafikverket

Trafikverket is responsible for the planning, construction, and maintenance of all state owned transportation infrastructure (Trafikverket, 2014). This includes both road and railways. They are running several networks and conferences to engage various actors. The approach taken by these different actors is not consistent, and this reflects their operating conditions and resources. PTAs are definitely understaffed to be taking on this kind of collaborative project. Trafikverket is active in dialogues concerning city planning, regional goal setting, and the setting of guides and plans. This is where the so-called Four Step principle (Fyrstegsprincipen in Swedish) can be brought in, as it focuses on planning aspects of infrastructure development. The principle will be explained in section 4.8.1. In theory, this principle is heavily influenced by mobility management and is how it is integrated into those planning and infrastructure development processes (Dickinson et al., 2012; MOST, 2003).

Trafikverket intervenes only when there is actually a problem, if everything is running smoothly as is, or the free market has taken care of the situation, then they do not interfere, according to Roland Palmqvist (Personal communication, 15 July, 2015). Overcrowding and capacity issues are more obvious in areas which are densely populated, and so often rural areas feel as though they are being neglected because they simply don't have the same infrastructure issues to fix as do the cities.

Trafikverket would like to support other actors using mobility management, they don't want to take on projects themselves. Mobility management responsibilities and opportunities are not clearly defined in practise amongst various actors; whereas other aspects and responsibilities are strongly legislated. Previously Trafikverket took on a strong role financing and promoting mobility management projects, but has pulled back from such activities because it was losing its objective stance. In 2011 the national government put responsibility for influencing attitudes and behaviours onto the local level (Dickinson et al., 2012). PTAs are closest to the passengers, and thus are best positioned to take on mobility management projects (R. Palmqvist, personal communication, 15 July 2015). Trafikverket is happy to support in terms of appropriate methodologies, knowledge, and experience, but not with project management.

### 4.8.1   Four Step Principle

Both SWEPOMM and Trafikverket emphasise the importance of the Four Step principle for the diffusion of sustainable transport. The principle is intended to be used as a guide for strategic processes in all aspects of operations (Trafikverket, 2015; SWEPOMM, 2015a).

- The final step is to install new infrastructure, and is considered to be a last resort.
- Before that rebuilding of current infrastructure must be considered, to enhance its usability.
- Prior to all of this, measures to render the existing infrastructure more efficient must be taken.
- The first priority is to consider what is shaping the need for transportation, travel and modal choice.

The first two steps are clear examples of mobility management. The Infrastructure for a Sustainable Transport Bill 2001/2:20 supports mobility management explicitly, and encourages actors to encourage modal shift away from passenger cars through infrastructure planning. MOST (2003) celebrates the principle as an example of integrating mobility management into planning and early stages of project development to prevent lock-in to car based infrastructure.

According to Roland Palmqvist (Personal communication, 15 July, 2015) the Four Step principle doesn't fit into the concept of dealing on a problem basis, as it promotes planning and prevention. Now the standard technique is to identify problems, and characterise what the underlying factors may be. All stakeholders are gathered and meet on common ground to deal with the problem and develop a solution collaboratively. This process includes both private and public actors of any size. The most difficult aspect of this is to determine what the underlying factors are. Once a solution has been decided upon, resources tend to become available and financing is not an issue. Thus the Four Step principle is left out of the current mentality.

## 4.9  Committee for the Doubling of Public Transport Market Share

The committee for the doubling of public transport market share (hereafter referred to as The Committee) is made up of representation from Svensk Kollektivtrafik, the Swedish Bus and Coach Association, the Taxi Association, SKL, Train Operators, Trafikverket, and Jernhusen (not all of which are represented in Figure 4-1). The current chair of The Committee, Stefan Sedin, was interviewed, and is understood to speak on behalf of The Committee.

Samtrafiken had been asked to join, but declined the invitation at the time, likely because it had not had mobility management placed in its mandate yet. The Committee doesn't consider kommuner to be an important stakeholder, and does not reach out to them except through the inclusion of SKL. Communication through other channels would likely strengthen the

relationship to the mutual benefit of all parties involved. There has been some overlap between the activities of the organisations represented on The Committee, which is now reducing as each settles into their own niche. Most other national bodies have a similar strategic direction, thus paralysing conflict has not yet occurred.

The Committee provides support to both operators and PTAs. This is delivered primarily through networking opportunities to foster collaboration among actors. This allows many wonderful synergies, but requires that controversial issues are sidestepped and avoided completely. This has also been a source of overlap between the activities of different national actors. Interregional trains, not these networks or collaborative opportunities, are what have truly forced PTAs to open up their books, ticketing systems and timetables.

The Goal is an aspiration of the industry, not necessarily a concrete aspect of the strategic landscape of Sweden's political actors. The Goal's exact wording focuses on doubling the boardings of public transport in Sweden from the 2006 baseline by 2020 (S. Sedin, personal communication, 13th of July, 2015). Boardings are used as a proxy measurement to easily approximate market share. Each time an individual enters a vehicle it is counted as a boarding (Trafikanalys, 2015). Thus a trip which constituted taking the bus to the train station and the train to the final destination would count as two boardings. The Committee's activities focus on facilitating the process of improving the system offered by its members. The mentality is that the focus must be on the services offered, instead of merely the boardings numbers. The Committee has no authority to enforce The Goal.

Not all national organisations represented have adopted The Goal, and not all members within the organisations have recognised The Goal. The independent operating conditions and resources have meant that there is no common plan for the achievement of The Goal. There is also no budget allocated specifically for it.

Focus remains on maintaining or improving existing systems and infrastructure instead of developing a vision for shifting attitudes and behaviours to ameliorate the view of public transport over the passenger car. Multi-modal transportation is not yet considered by The Committee or its members. PTAs and Swedes in general are slow to bundle services.

Currently fuel taxes, and tax breaks which favour car commuters, are significant barriers to The Goal (S. Sedin, personal communication, 13th of July, 2015). Quality of service delivery is yet to be delved into. The societal views of public transport is so despondent in some areas that the quality would have to improve drastically to attract new riders.

Different levels of governance are not forming common bridges. SWEPOMM and European Conference on Mobility Management (ECOMM) have not been a part of the doubling committee or The Goal. Very little guidance comes from the EU, except in relation to a specific project. A focus and plan for mobility management from the national level might foster collaboration, but this is not guaranteed. Landsting are free to make decisions, but by the principle of subsidiarity, decisions are to be taken at the lowest possible level of governance. This means that kommuner may have a better case and ability to implement behaviour changing laws and that the national level should not intervene, but may only guide and support.

## 4.10 System Interactions

It is clear from the findings and resultant Figure 4-1 that the system under discussion is quite complex. This is especially true when it is considered that not all actors on The Committee are presented in the figure. The Swedish style of management and governance tends to be less hierarchal, and is more flat. This is a contributing factor of the complexity of the system. Each

actor has a different domain within which to act, and they do not answer to each other or receive direct instructions on their normal operations. This is empowering in some instances, and problematic in others. With regards to engagement with mobility management it has meant that engagement has been uneven, and coordination has been problematic. This has resulted in a total lack of support for engagement with mobility management among the national organisations who interact directly with PTAs.

Mobility management requires that multiple actors engage simultaneously and in a coordinated effort. In this system of multiple autonomous actors, there are no clearly defined hierarchies of communication, initiative, or power. Thus lessons from SEA's experience of holding the mandate for encouraging mobility management are not being shared with Samtrafiken who currently has the mandate, nor were they shared with Svensk Kollektivtrafik when they held the mandate. These organisations are noted to be on opposing sides of Figure 4-1.

Potential issues arise if a PTA requests guidance from one national organisation, but should perhaps be asking a different one with more institutional knowledge or expertise in the area. Initiatives from one organisation may undermine or counteract initiatives in others, unless their actions are coordinated appropriately. The risk is great that confusion will occur if these organisations are making recommendations for multi-stakeholder programmes such as mobility management

As the system is decentralised and flat, there is currently no formal channel for Samtrafiken to communicate with other national actors as they have not engaged with each other yet. The committee to double could potentially become a focal point for discussions, but its mandate and action must be strengthened in order to accomplish this. Currently it is simply not robust enough to enforce any plans, or gather support for The Goal.

# 5 Findings from PTAs in Sweden and Internationally

The purpose of this chapter is to present the findings from investigations into the framework conditions for the engagement with mobility management under two circumstances. First the findings from PTAs in Sweden are presented. They are followed by findings from international contexts where PTAs are successfully using mobility management as part of their activities. Finally the two are compared. Findings are organised in accordance with the PAIRs scheme, elaborated upon in section 2.1.

Sections 5.1.3 and 5.2.1 of this chapter contain the response to the first research question, as stated in section 1.2:

*To what extent is mobility management used today by public transport authorities, or administrations?*

The results of the desktop search demonstrated that very few PTAs are engaging with mobility management, despite the suggestion in MOST (2003) that they are poised to undertake it. This gap not only exists in Sweden, but in all of Europe, and internationally. This could be due to a number of factors, but the most frequently reported by interviewees is the mentality that mobility management is best applied on a site by site or case by case basis. This mind-set is born both out of a lack of political will to support widespread application of the concept, and a lack of vision on the part of the interviewees. Most interviewees from PTAs stated that "other actors" were slow movers, or that their focus was on practical operational aspects and less on more abstract theoretical things; most interviewees from organisations who deal with PTAs reported that the PTAs are operating under such stressful conditions that they cannot deal with planning or visioning activities. This creates an unfortunate reinforcing feedback loop which is preventing PTAs from identifying and seizing opportunities through mobility management to reduce their costs and increase their revenues.

## 5.1 Swedish PTAs

The focus of this section is on the framework conditions for the PTAs operating in Sweden. Findings from interviews and literature are organised thematically together.

No interviewee was able to confidently answer all questions, and thus concrete quantitative data is inherently biased towards the knowledge and experience of the range of interviewees as opposed to the range of framework conditions in Sweden. However, this also reflects the reality within PTAs; that mobility management is dealt with in different ways, and within different portfolios, in different PTAs. It is anticipated that due to the variety of roles of interviewees included, the balance of opinions is well rounded and has not affected overall results. It is therefore not considered a significant limitation that the role held by the interviewee was not consistent in each PTAs. Thus the variety of perspectives of interviewees reflects the perspectives held by PTAs, and the data is biased, but not unusably so.

### 5.1.1 Basic Conditions

Table 5-1 shows that the number of boardings per inhabitant have indeed gone up since the baseline of 2006, but only a 14% increase has occurred. If this trend continues, in 2020 there will be less than 165 boardings. This is not sufficient to achieve The Goal, in fact it falls nearly 100 boardings per inhabitant short. It is also evident that the number of cars per inhabitant is increasing.

*Table 5-1 Boardings per Swedish inhabitant from 2004 until 2014*

| Year | Inhabitants (thousands) | | Number of cars per inhabitant | | Boardings per inhabitant |
|---|---|---|---|---|---|
| 2004 | 8,994 | | 457 | | 125 |
| 2005 | 9,030 | | 460 | | 125 |
| 2006 | 9,081 | | 463 | | 130 |
| 2007 | 9,148 | | 466 | | 132 |
| 2008 | 9,220 | | 464 | | 134 |
| 2009 | 9,299 | | 462 | | 134 |
| 2010 | 9,378 | | 462 | | 136 |
| 2011 | 9,449 | | 466 | | 141 |
| 2012 | 9,519 | | 467 | | 144 |
| 2013 | 9,600 | | 468 | | 148 |
| 2014 | 9,696 | | 473 | | 148 |

*Source: Style Trafikanalys (2015)*

When asked if there was a clearly defined mobility culture in their län, respondents overwhelmingly replied that car culture is strong in their area. Of the eighteen interviews conducted, fifteen considered the passenger car to be the dominant and preferred means of transportation. The modal split of passenger travel in Sweden is, in fact, overwhelmingly the passenger vehicle at 83% of passenger kilometres travelled in Sweden in 2011 (Eurostat, 2013). City dwellers are viewed as having a more open mind-set to modes of transport aside from the car than residents of more rural areas. There are urban pockets where other modes of transport are beginning to dominate; urbanisation is sometimes identified as the driver for declining use of the passenger car (Bastian & Börjesson, 2014). Seven interviewees suggested that cars are less dominant in the city than in rural areas, including in Stockholm were 50% of trips are taken on public transport (P. Hallberg, personal communication, 11 June, 2015). This is confirmed by Table 5-2 with data from Svensk Kollektivtrafik (2015a) on the modal share of public transportation in each län.

*Table 5-2 Modal share of public transport in Swedish län in 2014*

| Län | Market Share of Public Transportation |
|---|---|
| Stockholm | 51% |
| Västra Götaland | 28% |
| Skåne | 26% |
| Uppsala | 26% |
| Västmanland | 18% |
| Gävleborg | 15% |
| Jönköping | 14% |
| Värmland | 14% |
| Blekinge | 13% |
| Örebro | 13% |
| Södermanland | 13% |
| Västerbotten | 13% |
| Halland | 12% |
| Kronoberg | 11% |
| Norrbotten | 11% |
| Kalmar | 10% |
| Dalarna | 9% |
| Västernorrland | 9% |
| Gotland | 7% |

*Source: Style Svensk Kollektivtrafik (2015a)*

Outside of Gothenburg, Stockholm, and Malmö, the passenger car is the primary way to travel around and public transport is fighting an uphill battle against this option. This is due, in large part, to the limited supply of sustainable transportation options, and of awareness that the options that do exist are there. The residents of rural areas are generally using only their cars for transport, unless they are school children travelling to class. The public transport doesn't always exist where and when it is needed or wanted, and the availability of tickets and passes is a significant point against the usability of the services according to interviewees. Car culture in Sweden began with strong influence from the American notion that public transport is only a service for those who do not have access to a car (Lundin, 2004).

Only six interviewees thought that there was a sufficient supply of alternatives, and three of those six stated that their systems are currently at capacity. This implies that only three interviewees considered that there are opportunities available for more individuals to shift their travel away from passenger cars. Interviewees reported that public transport could provide an excellent alternative if it was better funded so as to provide more frequent service to rural areas. As it stands now, those interviewees feel that public transport is not an acceptable alternative to the passenger car due to its slow and infrequent service. This is confirmed by the upwards trend in car ownership in Table 5-1, as Swedes are providing their own supply of transportation.

The theoretical phenomenon of peak car is frequently raised in discussions of car culture in Sweden. The theory states that car use in Sweden has stopped its historically steady increase, and is in fact decreasing and will continue to do so (Trivector, 2015b). The reasons for this phenomenon are not clear or delineated, but potentially include urbanisation, the importance of Information Technology in modern lives, changing attitudes and behaviours towards

passenger car travel, and the new roles played by the passenger car in younger generations. The limited data available in Table 5-1 suggests that the peak has not yet been reached, but that there has been a reduction in the rate at which car use was increasing. Bastian & Börjesson (2014) demonstrated that the economic variables gross domestic product per capita and fuel price explain most of the decrease between 2002 and 2012 in Sweden. Thus it is not consistently accepted that newly prevalent attitudes have resulted in changes in behaviour, nor that if gross domestic product per capita or fuel price trends reverse their long-term directions that reduction of the increase in car use will continue. Interviewees in rural areas did not express belief in peak car, and even those in urban areas with high modal share of public transport did not anticipate peak car to occur organically. If the peak car phenomenon is to help achieve The Goal, then it must receive support and encouragement as it will not be fast enough on its own.

Transportation policy is, in theory, geared very much to achieving strategic environmental goals across Sweden. However that theory translates in different ways to different PTAs. Karlstad bus is able to finance environmental initiatives due to its high boardings. Other PTAs are not, and are not necessarily seen as part of the picture to achieving better air quality, or mitigating climate change as part of other actor's policies and plans. The policies are not always accompanied by actionable plans, and so may remain merely high level goals, not carried out or implemented. Moving kids to school, or people to work is the main priority for resource strapped PTAs. Investments in all aspects of infrastructure are more often made in cities than in rural areas, as there is a focus on investing in more densely populated areas, dealing with existing issues, and maximising the socio-economic benefit of tax dollars spent. Knowledge regarding overall goals varied significantly amongst interviewees, which is understood to be a reflection on the internal culture at PTAs of communication or lack thereof on the subject matter.

### 5.1.2  Inverse Policies

Interviewees reported that they didn't believe that there were any *intentional* policies fighting sustainable transportation. Eight could not identify any policies or practises which undermined their initiatives. The others raised several examples of policies that promote car use that stem from other levels of government or the private sector. These included: free parking offered by shop owners to attract customers; infrastructure investments that don't allow for public transport expansion and growth, such as building over allowances for future bus rapid transport; topography and street geometry of new areas, and how curves in the landscape are built around to allow only for passenger cars not relatively longer buses; the tendency for institutions to remain constant in their practises; lack of tax incentives for commuters with public transit, or more precisely put, lack of awareness of tax incentives for public transport users; inappropriate fuel taxes; lobbying by the car industry; and historic investment which has led to car centric infrastructure.

Parking is a strong basis of the car society because passenger cars spend so much of their lifetime parked (Lundin, 2004). Therefore any source of free parking identified, even if only by 4 interviewees, may have significant impact on PTA operations. Tørnblad et al., (2014) identified parking as the first reason for their failed mobility management experiment with companies in Norway.

Traffic infrastructure began to purposefully favour car travel after World War II in Sweden (Lundin, 2004). In some rural regions, there are not even sidewalks where pedestrians could travel safely short or medium distances. This inhibits both development of public transport, but also other modes and informal initiatives such as carpooling.

When comparing the state information on the tax allowances for transport, public transport costs may be deducted after an initial cost threshold of 10 000 Swedish Kronor if you live more than two kilometres from your work. You may only deduct the amount equivalent to the cheapest means, and if the trip is paid by the employer then it must be registered as salary, after which it may be deducted (Skatteverket, 2015 a). When deducting amounts for travel by car, the same initial threshold applies and you receive a set mileage amount. The minimum distance required is waived if there are no public transportation options available in the area (Skatteverket, 2015b). There are other deductions available depending on how the car is used in relation to work.

### 5.1.3 What is Being Done with Mobility Management

When asked directly what is being done with mobility management, PTAs generally reported that they don't do anything of significance. PTAs emphasised that their focus is not on mobility management because they focus on sustainable transport. They were not necessarily receptive to the author's explanation that the concepts are strongly linked. With some probing, explanation, and rearranging of key words, it was discovered that only two PTAs insisted that they don't utilise mobility management in one form or another. However both of them later contradicted themselves and gave examples of mobility management projects. The definition of mobility management is quite loose, thus giving concrete examples is quite difficult for those unfamiliar with the term, which may have led to the confusion.

One interviewee insisted that people will not change their habits, and engaging with concepts to try and shift people's common mode of transportation is a lost cause. This indicates that there are strong mind-sets within the PTAs which will be a barrier for engagement with mobility management. This is also the case outside of Sweden, and is suspected to be inherent in the industry (M. Sloot, personal communication, 30 June 2015). The interviewee from Stockholm expressed that he didn't want boardings to increase as the system is currently at capacity.

Based on statements from interviewees from both PTAs, and those in national organisations, it appears that in the Swedish context, kommuner are currently the most effective actors in the development of sustainable transportation and the use of mobility management. They are actively developing sustainable urban mobility plans to deal with problems caused by the concentrated car use which occurs in city centres. They are also using the tools and networks available to them to share information and exchange knowledge with each other.

Twelve interviewees were actively using mobility management to increase their boardings, and the other six were doing so to better serve their passengers while reducing their operating costs.

Four categories of engagement with mobility management common to Swedish PTAs were identified by interviewees: offering of trial or discounted passes, enhanced communication, systems optimisation to meet current demand, and reaching out to sources of demand in the private sector to accommodate potential demand from their locations. All of these campaigns were undertaken to increase the number of customers, or increase the frequency with which current customers use their services. Table 5-3 summarises the activities of each PTA. Please note that this does not represent an exhaustive list, only what interviewees highlighted.

*Table 5-3 Summary of engagement with mobility management as brought up in interviews with Swedish PTAs*

| PTA | Trial Period or Pass | Communication | Systems Optimisation | Outreach to Private Sector |
|---|---|---|---|---|
| Blekinge County | | Applications for Smartphones, Screens at stops | Work to answer demand and provide for commuters | |
| Dalarna County | | Applications for Smartphones, Screens at stops and on buses | Implemented new system to improve trip time with express routes | |
| Gotland County | Travel is free for those under 20 | Applications for Smartphones, Screens at stops and new ticketing system which gathers operating statistics | Using DRT to free up big buses for more popular routes and optimise resources | |
| Jämtland County | | Applications for Smartphones, Screens on buses | | |
| Jönköping County | | Applications for Smartphones, Screens at stops and on buses | | Considers the private sector to be a limited stakeholder |
| Kalmar County | Offered one unsuccessful free trial | Applications for Smartphones, Screens at stops and on buses | | |
| Karlstad Kommun | | Applications for Smartphones, Screens at stops and on buses | Offers Free Park and Ride facilities to attract travellers from the rural areas | |
| Kronoberg County | Marketing department offers free test tickets | | | |
| Norrbotten County | Offers targeted discounts through private sector employers | Applications for Smartphones, Screens at stops | Shifts timetable to match employer shifts | |
| Östergötland County | Offers 14 day trials through employers | Applications for Smartphones | Installed both park and bike and ride facilities | Works with events and employers to accommodate increased demand |
| Skåne County | | Applications for Smartphones, Screens at stops and on buses | | |
| Stockholm County | | Applications for Smartphones, Screens at stops and on buses | | |
| Uppsala County | | Applications for Smartphones, payment card opens car-sharing and rental bikes | Focus on interchanges and facilitating other modes | |

| PTA | Trial Period or Pass | Communication | Systems Optimisation | Outreach to Private Sector |
|---|---|---|---|---|
| Värmland County | | Applications for Smartphones | | Project coming in 2016 to target private employers in 10 different kommuner to get to their employees |
| Västerbotten County | | Applications for Smartphones, Screens at stops | Installation of park and ride facilities outside of major centres like Umeå | |
| Västernorrland County | Target employees who travel by car, with special trial offers through employers | Applications for Smartphones, Screens at stops | | |
| Västmanland County | | Applications for Smartphones, Screens at stops | | |
| Västra Götaland County | Yearly free trial offered to a targeted group of car drivers | Applications for Smartphones, Screens at stops and on buses | | Offers combination tickets with such things as gym passes |

Eltis Case Studies, a database available through EPOMM was used to search for PTAs using mobility management. In Sweden only two cases were found which involved PTAs engaging with mobility management. Both cases consisted of projects offering free trial passes for a limited time to a targeted group of people. Neither was within the last two years, although they appear to have been successful they also appear not to have been continued.

There is certainly a lot being done with mobility management in Sweden; PTAs are being modest about their programmes. Initiatives reported by interviewees ranged greatly in size and scope, and many were successful. Interviewees expressed concern that engaging with abstract concepts, such as mobility management, will somehow incur extra costs or defect from their practical and operations based mandate. This is illustrative of the lack of awareness regarding the services and benefits of engaging with the concept. The fact that there are numerous networks available which the PTAs are not participating in may justify the relative lack of engagement and initiation of more visible projects. They are simply not participating in some of the supportive mechanisms which exist, or reporting their projects as within the concept of mobility management.

The service categories identified in Table 5-3 did not match perfectly with those in MOST (2003), described in section 3.4. While most of the services were covered, the notable exception was that of Consulting, as illustrated in Table 5-4. Information and Advice, Awareness, Transport Organisation and Co-ordination, and Sales and Reservations are all encompassed in ongoing activities.

*Table 5-4 Comparison of services identified in MOST, and categories of engagement with mobility management common to Swedish PTAs*

| Information and Advice | Awareness | Consulting | Transport Organisation and Coordination | Sales and Reservations |
|---|---|---|---|---|
| Trial Period or Pass | Trial Period or Pass | | | Trial Period or Pass |
| Communication | Communication | | Communication | Communication |
| | | | Systems Optimisation | |
| | Outreach to Private Sector | | Outreach to Private Sector | |

It was not anticipated that PTAs would be reasonably positioned to provide unbiased Consulting services, and thus their lack of participation in that project type is both expected and desired. The projects undertaken engaged across multiple-service types, and are thus expected to be more successful than they would have otherwise been. This indicates a broad-based engagement with the mobility management concept, even if PTAs were reluctant to consider their actions as such.

### 5.1.4   Policies – High Level Guidance and Course of Action

#### *Higher Level Guidance*

There is no guidance received from the EU level, unless it is attached to the funding of a specific project or activity. Swedish national agencies do not provide guidance, but do provide several platforms for networking and collaborations amongst the PTAs. The organisations which were reported to facilitate effective networking by eight interviewees were SKL, Svensk Kollektivtrafik, and Samtrafiken. Trafikverket offers specific requirements on specific projects when there is funding attached. These relationships are shown in Figure 4-1. Generally the role of national actors is supportive, but not guiding. Their mandates with regard to mobility management are unclear, as national politicians have not given any one actor a strong mandate since they removed it from the SEA. This has created problems as interviewees from PTAs who sought help or clarification of an issue found that there was either no one organisation to guide them, or they received conflicting advice from multiple sources.

#### *Societal Concerns*

Societal concerns related to transportation, as reported by interviewees, varied. Bastian & Börjesson (2014) found that personal economic incentives caused transportation behaviour change without necessarily impacting attitude or awareness. All interviewees confirmed this and began by stating that personal economics on behalf of the individual were the primary factor, however, when prompted, a variety of other opinions surfaced. Figure 5-1 shows the frequency of their most common answers. One answer given summarised perfectly all other responses; there is no one societal concern or priority, because there is not one societal viewpoint.
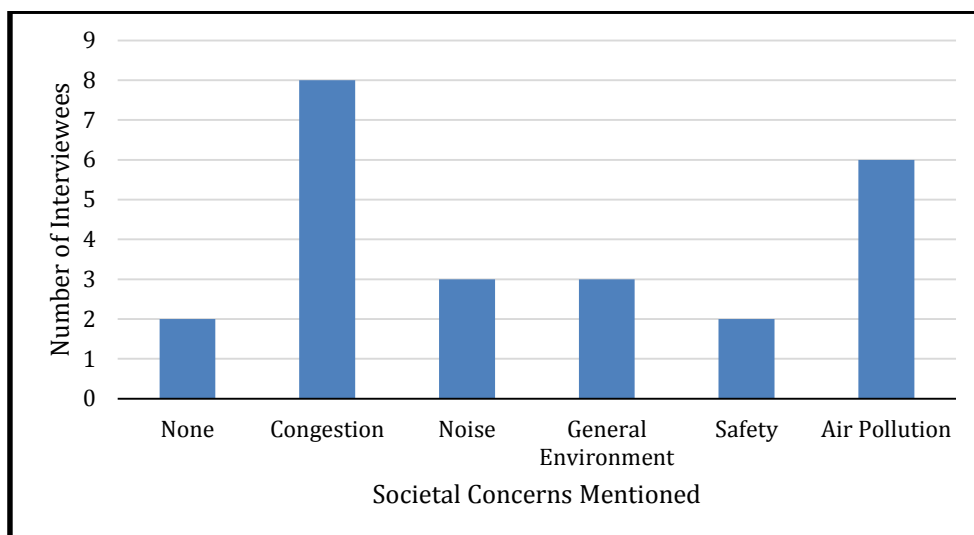
*Figure 5-1 Frequency with which societal concerns were mentioned by interviewees from Swedish PTAs*

Bikers, pedestrians, drivers, and those who take public transit will all be affected differently by different aspects of any situation, and will already have inherent bias which has led them to choose their mode of transport, emphasising their already held beliefs. Therefore there cannot be only one overarching concern from a societal perspective regarding transportation.

## *Responsibilities*

Interviewees were most certain of the roles and responsibilities of different actors in situations where funding or land ownership was involved. However, responses given by interviewees varied greatly. This likely reflects the variety of roles that interviewees fulfilled in their respective organisations, and the style of relationship that each organisation has taken on. Only four interviewees responded confidently that there is formal interaction or documentation on how to interact with each other, or with other actors such as national networking organisations.

Each actor is fairly autonomous, and this can be empowering in the promotion of one's own agenda, but limiting when an essential aspect of a plan is not under one's own control. An example of this, is that PTAs, with the exception of Västtrafik, are unable to install bike racks at stops and stations to promote intermodal trips because the area around these stops is owned by the local kommun or other actors. Most PTAs are able to set their own routes and timetables, but some have these aspects of operations essentially dictated by the Kommunfullmäktige.

One interviewee indicated that interactions with the private sector become difficult because of the rules dictating that the private sector cannot guide public sector actions. This would present a conflict because Swedish public funds cannot be controlled by private interests. This makes mobility management engagement with private sector employers awkward; if they are pursued, all actors must behave as though they are walking on eggshells.

### 5.1.5   Actors and Structures

## *Champions*

Only two champions for mobility management were found in PTAs in Uppsala and Östergötland, Sweden. Two further interviewees indicated that champions exist outside of their organisation, but neither was certain of their realised impact. Of those PTAs engaging with mobility management, it is seen as a group effort, with everyone in the organisation taking some aspect of mobility management into account in their work or trying to include mobility

management in all of their tasks. Interviewees accounted for this by emphasising the small size and close knitted work atmosphere of each PTA. It should be noted that interviewees did not indicate that those working within PTAs had enough time or autonomy in their portfolio to push mobility management on their management or organisation.

### Cooperation in Governance

Across Sweden, there was little to no cooperation with actors outside of governments during daily activities. Kommuner were the primary stakeholder mentioned by nine interviewees. Their relationships varied, as some kommunfullmäktige are unwilling to let PTAs influence their planning process and see PTAs as a tool for their use, while others listened to and were influenced by their needs. Trafikverket was also brought into the conversation as both a helpful collaborator and a barrier to infrastructure funding. If they only fund a limited investment in transportation infrastructure, then kommunfullmäktige may choose bike lanes over bus lanes, as promotion of cycling is worth more "environmental points" than the promotion of public transport. Thus, bike lanes allow more flexibility to put in capacity for passenger cars.

Occasionally visioning projects bring together more actors for collaboration, but these are exceptional cases. They were highlighted only in län containing the three major cities or through which high-speed rail between those cities may pass.

### Consistency

The consistency in approach of stakeholders varied for each interviewee. Those reporting that they work with mobility management, also reported that they feel that other actors are on the same page as they are, and are reasonable to work with. Others emphasised that kommuner and län, not only have different operational budgets, but also strategic goals. National organisations are not clear in their mandates, and are also obviously not communicating to each other as their messages to PTAs regarding mobility management overlap and contradict.

Opportunities for action are also very different with different stakeholders. Tight budgetary constraints are either a source of common ground, or a divisive factor. There is also a lack of societal awareness regarding the concept of mobility management and benefits of engaging with it, which may be leading to a lack of consistent motivation due to ignorance.

### Qualifications Within PTAs

It was found that expertise in communications is limited within PTAs. This expertise is either contained in the marketing or communications department, or outsourced to a marketing firm.

### Embeddedness

Embeddedness of mobility management varies from PTA to PTA. Eleven interviewees stated that mobility management was embedded into the portfolio of every employee at their organisation, however there was often poor inter-departmental communication and so it is likely that interviewees were unable to comment as broadly as they did. Only four interviewees identified that there were designated mobility management experts or departments within their organisation, and so mobility management may be embedded by default. However, that does not mean that the concept is utilised, or that the ideas are translated into actions. For two interviewees, mobility management is understood to be engaged with in specific projects, but not in daily operations.

### Knowledge Exchange and Experience Sharing

There are two sets of four län who share timetables, and who have compatible payment cards. Skåne, Kalmar, Kronoberg, and Blekinge; and Norrbotten, Västerbotten, Jämtland, and

Västernorrland are the four most southern län, and the four most northern län respectively. Their PTAs meet regularly to discuss planning and ticket sharing. Experiences and promotions do not transfer between regions, and so marketing has to be done on a län by län basis.

More than one interviewee stated that their organisation was the first mover on mobility management in Sweden and so had no one else to learn from. This could reflect the lack of awareness of the operations of other PTAs as well as regarding the general concept of mobility management. Clearly there is a lack of communication regarding mobility management.

When asked if there were any reports available publicly, either on specific projects, or more generally, the response was poor. No interviewees reported project specific reports, and only six reported that they published their own annual reports. In the absence of their own reporting scheme, the PTA is included in the län annual report or financial reports. Thus opportunities for communication and documentation are limited. One interviewee in Uppsala stated that she preferred to do press releases rather than reports. This lack of published communication material may be furthering the lack of awareness and communication regarding mobility management.

Figure 5-2 shows the frequency with which interviewees named various platforms used to exchange knowledge and share experiences. PTAs going to EU level for guidance and exchange is very limited, only one interviewee had attended or heard about ECOMM. Two interviewees stated that they were members of the International Association of Public Transport (UITP) instead, and found it to be a useful platform. Most collaboration and networking occur through networks set up through Swedish national authorities such as SKL, Svensk Kollektivtrafik, and Samtrafiken, and networks set up by the private sector such as the ticketing system providers. Eleven interviewees stated that they attended and took advantage of information at those network meetings, but the usefulness of information received there varied depending on the operating context of each PTA.
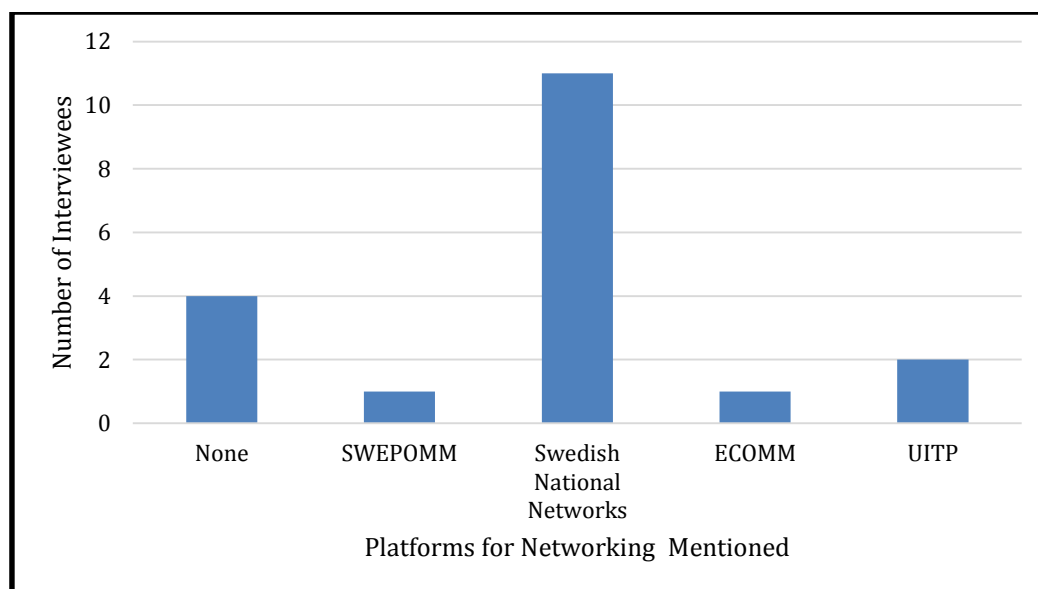


*Figure 5-2 Frequency with which platforms for networking were mentioned by interviewees from Swedish PTAs*

That the Swedish national networks are the most popular is unsurprising given the mentality that Swedish PTAs have the most to learn from each other, and very little to learn from the rest of the EU. However these networks have not yet incorporated mobility management into their

seminars (as discussed in chapter 4), and so the knowledge and experience sharing which is occurring there is likely on other aspects.

SWEPOMM was attended by only one interviewee from Uppsala as part of her current role. It was suggested by two interviewees, that the platform is geared towards kommuner and stad and would not be useful for PTAs. These two had attended as part of previous employment at other organisations.

### 5.1.6   Integration and Linkages

#### *Multi-Modal Travel and Interchanges*

All interviewees had an awareness of the need to support multi-modal transport to achieve environmental sustainability goals, however the implementation of measures and responsibility for those measures varied greatly. For example, PTAs in the most northern and rural areas view buses as easy to provide and what is being demanded from the public; therefore other actors should build facilities to bring people onto their buses via different modes.

All interviewees preferred park and ride and bike and ride facilities over allowing bikes on their vehicles and including car-sharing in their networks. The relationship between bikes and buses was discussed by interviewees, but not the relationship between trains and bikes. This was due to the standard of having bike parking facilities available at train stations. Interviewees were not consistently articulate regarding reasons not to allow bikes on buses, but reasons stated fell into two categories; reasons to not allow bikes on buses, and reasons that bikes are not considered as part of the transport system.

Not allowing bikes on buses was justified based on:

- security or safety concerns for the driver and other passengers
- the negative impact on the bus timetable
- potential conflict for cargo space with wheelchairs, strollers or other mobility aides
- and the desire to target and attract car drivers instead of cyclists

Not considering bikes as part of the transport system was justified based on:

- the weather during winter months
- long distances between towns or areas of interest

Park and ride facilities or bike and ride facilities were noted from seven interviewees, though none were owned by the PTA. These were especially important facilities in areas where the population is sparse and there is a congested socio-economic centre. A small number of interviewees insisted that multi-modal aspects would not be actively addressed as it would require too much investment to change car-drivers behaviour even slightly. Four interviewees suggested that their inclusion of cars as part of their transport system is a hook to try and lure those drivers to make a more substantial shift.

PTAs in Sweden do not own land around their stops or interchanges, and so they are trapped by what the local kommun and national actors decide to do and focus on. According to the one interviewee from Västtrafik, they are an exception to this. That organisation is able to leverage its land around interchanges to promote multi-modal transport including their services. Interchanges are becoming more important as part of strategic goals put in place by kommuner and national organisations; this should present an opportunity for PTAs to collaborate but it

has not yet materialised consistently. Interchanges were seen as a missed opportunity to promote public transport by twelve interviewees. One interviewee articulated that their current view is that they offer access to other modes to fill geographical gaps in services available from the PTA, but not more.

### Push and Pull

All interviewees were able to use pull measures, however eight interviewees stated that they didn't feel that they should use push measures. This was either because there is not a sufficient supply of alternatives to the passenger car or that they felt that pull measures were more effective. Push measures may be more likely to produce a strong rebound effect than a noticeable increase in public transport usage.

Two interviewees were particularly insightful and expressed that, travel is made together, and so you can't punish one sector, or count on a sector which is being punished in another way, and that if boardings are low, then PTAs are not in a position to punish anyone for any behaviour and must welcome everyone on-board.

### Technology

Swedish PTAs have integrated technology into numerous aspects of their services including allowing customers to pay via an app, providing Wi-Fi on buses and trains so that apps can be used there, sharing information on buses and at stops regarding expected arrival times, and using gathered statistics to better serve their clientele. Information is either presented in real time, or will soon be available in real time. Any interviewee who indicated that they were dissatisfied with their current level of technology integration also indicated that system upgrades were forthcoming.

Five interviewees reported that they were either currently or have plans in the near future, to take advantage of the data they are collecting to improve their services in quality and scope. Three were trying to use technology to incorporate other modes by using the payment card as a key to open car sharing vehicles, or incorporating bike rental stations into their App for trip planning.

### Land Use Planning

Land use planning falls under the jurisdiction of other actors, such as the kommuner. PTAs have expertise to offer the process, however it is not always taken into account or welcomed. One interviewee reported that a kommun had constructed roads in such a way as to prevent buses from being able to navigate them safely. Other interviewees were more positive regarding their relationship with planners, sometimes referring to communication as a two-way street. Twelve interviewees stated that the local kommuner only considers their expertise late in the process, or in such a limited fashion that it is of no influence or use.

### Non-Transport Policies

Not a single interviewee had any knowledge of mobility management or sustainable transport coming into consideration in other policy areas. One interviewee indicated that the mobility management concept is coming into the public health mentality, but also that it was not sufficient at this point to influence policy or have a measureable impact on the PTA. Recent estimates have suggested that an expenditure of 4.5 billion Swedish Kronor could be saved in Skåne alone if public transport is doubled in accordance with The Goal (Ljungberg et al., 2015). It stands to reason that mobility management should already be there, both because of the potential savings, and because the level of governance is the same for public health and public transport.

### 5.1.7   Resources

## *Human Capacity and Expertise*

The extent of human capacity and expertise within PTAs varied depending upon the level of engagement and size of organisation. Those organisations that engaged with the concept had capacity dedicated to mobility management. Those organisations that did not have specific individuals allocated to work with mobility management on a full time basis, but instead spread the burden amongst everyone, did not have access to any experts or expertise specific to mobility management. Seven interviewees indicated that expertise is accessed from external sources only in relation to specific projects. This may include activities required for funding applications, for special promotional campaigns, or the planning collaboration ongoing with Trafikverket and kommuner.

## *Financial Support*

Financial support varied significantly across all PTAs in Sweden. Those who have had successful projects under the name of mobility management have less difficulty securing funding for subsequent projects. All expenditures of public money must be motivated, and it is much easier to motivate the spending of tax dollars if the mobility management concept has been proven to function successfully within the conditions specific to each PTA. One of the interviewees who reported having tried and failed, also reported that funding was easily acquired. Funding is set by the political council, and is thus very controversial. If there is not political will to support modal shift from cars to more sustainable options, then mobility management will not be invested in. National organisations tend to focus support (financial and otherwise) on cities, and rural areas reported feeling that they are ignored.

## *Economic Shifts*

Economic shifts, such as new national taxation, or macro-economic crises have the potential to affect all aspects of a society. All PTAs are operating on a tight budget, and are at least partially funded by income taxes. Depending on the public's response to macroeconomic shifts, PTAs can benefit or suffer. Commonly boardings are affected; either increased as more people leave their expensive car in the garage and take the more economic bus, or decreased as more people choose other modes as ticket prices increase. The response varies dramatically depending on factors pertaining to individuals and households. If tax revenue is affected, then budgets which were already tight are further reduced. However, it is difficult to identify exactly what causes shifts in boardings and revenue, and therefore impossible to measure effectively.

One interviewee emphasised that transport industries are made by many different sectors and actors, thus if one sector is impacted, it will always affect the PTA in one way or another. Another interviewee emphasised the importance of perception in budgetary allowance. If the budget is perceived to be too tight to justify expenses on new initiatives, such as engagement with mobility management, then projects which could benefit travellers and the PTA may not be allowed.

## *Information and Guidance*

Only one of the interviewees reported taking advantage of the EU toolkits. However, partnerships with external actors and Trafikverket were mentioned as an exterior source of expertise and project suggestions, in place of EU toolkits from EPOMM.

## *Quality Management and Assurance*

Three interviewees reported that their organisations were actively using either quality management or assurance techniques internally. One had tied quality of service delivery to an

incentive scheme for operators, and the other two were dissatisfied with their current tools. Five reported that they depend on statistics and quality indexes provided by national organisations such as Samtrafiken or Trafikanalys. All interviewees reported receiving feedback from customers via email, phone, and social media platforms. Eight reported conducting customer surveys, via phone or email. It was unclear how this feedback is tied into improvement of services, or how relevant it is to their operations. The quality management technique "EFQM" was not mentioned by any interviewees.

### *Legal Requirements*

No interviewee reported being legally bound to engage with mobility management, or that any of their stakeholders were. When probed regarding Trafikverket's Four Step principle, interviewees reacted in a positive yet non-committal way. The steps are viewed as important for other actors, but not for the type of decisions and planning done by PTAs. One interviewee insisted that the steps are a barrier to accessing funding, and that there is actually very little benefit to them. The interviewee from SEA had suggested that legal requirements to engage with mobility management are forthcoming, but could not give a timeline or specific details.

### 5.1.8   Summary of Conditions

It is clear from the above results that support is lacking in all domains of the PAIRs scheme for Swedish PTAs. It is also clear from Table 5-3 that this has not prevented PTAs from engaging with mobility management, but may have limited that engagement significantly.

## 5.2  International PTAs

The focus of this section is on the supportive conditions for PTAs operating in contexts which have allowed the successful use of mobility management. The cases are presented with respect to the PAIRs scheme, instead of as strictly separate cases. This was done to place the emphasis on the difference in support in domains and the potential impact that each aspect has had, instead of the narrative stories of each case.

Four cases were chosen for inclusion in this section. All were from Canada, two are located in more rural areas, and two are in major urban centres (The Greater Toronto and Hamilton Area (GTHA) and Metro Vancouver). Three were located in the Province of Ontario, and TransLink is in the province of British Columbia. These were chosen as in each case, mobility management techniques were used or supported in order to change attitudes or behaviours towards public transport. In Metro Vancouver, British Columbia, TransLink has been using mobility management to align their services with traveller requirements and increase their boardings. In the town of Milton, Ontario, mobility management is used as a means to provide the most cost effective transportation solutions to the residents. The Ontario Healthy Communities Coalition (OHCC) promotes mobility management techniques to support those who might not be mobile due to socio-economic factors all over Rural Ontario. Metrolinx, operating in the GTHA in Ontario, has absorbed a grassroots initiative into their programmes to better serve the commuters in the area.

It is considered a significant finding that PTAs working with mobility management are very difficult to identify. The list of case databases searched is available in Appendix C, and is extensive. Thus it is deduced that, either the correct conditions for mobility management are rare globally from the perspective of PTAs or that they choose not to communicate their activities and projects. In either case, there are numerous networks supporting mobility management which they are not participating in, and this is one of the many reasons other actors have initiated projects instead of the PTAs.

### 5.2.1  Engagement with Mobility Management

Each key informant interviewed engaged with mobility management in a different way. All services identified in MOST (2003), and elaborated upon in section 3.4, were being used by these cases.

TransLink provides public transport for the Metro Vancouver area, and has been using mobility management measures on an ongoing basis. This includes a variety of instruments, and relationships developed and maintained over time which encompass all services identified in MOST (2003). TransLink identified engaging with: Information and Advice to stakeholders and passengers; Awareness raising in targeted groups, but also within the general public; Consulting with stakeholders who create demand, such as schools and private sector employees, to ensure that the needs of citizens are met; Transportation Organisation and Coordination within their own operations as well as with other providers of transportation; and Sales and Reservation of tickets and passes designed to target different sectors. Due to the historic and extensive nature of their engagement this is not a complete or all-encompassing list. The primary goal of TransLink's transportation demand management team, at this juncture, is to imbed mobility management measures into other organisations so as to lessen the burden on themselves, and to leave a legacy in other organisations. This will facilitate future interactions and bring consistency to the approach taken by stakeholders, all while increasing boardings and maximising the use of infrastructure.

The Town of Milton is working with mobility management to maximise resources. This primarily consists of promotion of inter-modal transport including the GO Train, and implementation of alternative service delivery, including Demand Responsive Transport (DRT). The GO Train is a regional train, operated by Metrolinx, which connects much of the area surrounding the GTHA. Use of an app to book and pay for DRT has greatly reduced operating costs. Thus the only service not being offered is that of Consulting.

OHCC set up a network to promote knowledge exchange and a consistent approach to mobility management in rural communities in Ontario. This was done because previous efforts had failed to service those with elevated socio-economic needs, and often funding was being provided to projects that were doomed from their inception. 10 case studies were chosen by OHCC to showcase different mobility management transport initiatives that are appropriate in different community contexts. Each of the cases required different support, and had a different impact in their respective communities. They set up 3 webinars and 3 forums to disseminate knowledge and experience sharing of these successful cases. Thus the services not being offered through OHCC are Consulting, and Sales and Reservation of Transport Related Products. The OHCC is considered to be closer to one of the national supportive bodies than to the PTAs in Sweden. They are included in this section as they provide support for PTAs in their area and are able to comment on the conditions within which they operate, and engage with mobility management.

The Smart Commute programme under Metrolinx in the GTHA works with sources of car traffic and sets up programmes to shift the modal split to more sustainable options. It partners with employers, schools, and also with other programmes within Metrolinx to support and maximise usage of the GO Train network. It focuses on maximising infrastructure use by shifting demand. Its primary service is Consulting, but it also engages with Information and Advice and general Awareness.

All the programmes use mobility management to serve the citizens while maximising infrastructure use. They all promote inter-modal transport, and work with partners for funding

and coordination. This ensures a good return on investment not only on the mobility management programmes, but also on the physical infrastructure.

### 5.2.2 Basic Conditions

These basic conditions serve as the foundation and basis for the mobility management activities which are able to be engaged with. The mobility culture varied even within the jurisdiction of each individual interviewee. There were no common basic conditions as defined in the PAIRs scheme.

In each municipality within TransLink's jurisdiction, the mobility culture is different. Some are very car dependent, and others are very bicycle friendly. Good alternatives do not exist at the same service level in all locations, simply as a reflection of demand and cost of implementation.

Metrolinx serves such a diverse and large area that the conditions vary enormously across their jurisdiction. Car culture is very strong on the outer reaches which border rural Ontario, but it fades as you move into more densely populated centres. The Town of Milton has a strong car culture, with one exception; commuters travelling into Toronto are the exception to this as they use the GO Train quite heavily. This is because physical infrastructure, and therefore transport options, exists in the central urban areas that simply does not in rural regions. One county (The County of Haliburton) has had success in promoting active transport for health reasons, but there are simply not enough safe alternatives to the passenger car in other areas of Ontario. Individuals take a car if they are able to, and seek other options only if they must

Space allocation is the primary environmental factor associated with transportation throughout Ontario; energy and climate change are not factors for most individuals. Environmental sustainability as a basis for choosing a transport mode does not resonate well with citizens in Metro Vancouver as environmental factors more often confuse decisions instead of informing them.

### 5.2.3 Inverse Policies

Themes emerged across all jurisdictions, despite the fact that all interviewees were reluctant to provide concrete examples.

Availability of parking was the primary force against efforts by interviewees. It is politically impossible to suggest that citizens in the Town of Milton, or in rural Ontario should pay for parking. Conflicting goals of different actors are an important factor in this as, GO Transit might build another parking lot to increase its boardings, instead of engaging with local transit. Free parking is seen as an important aspect of attracting people to commercial centres, or other forms of transport, in areas where car culture is strong.

Within the built environment in each of the interviewees' jurisdiction, many streets are unable to accommodate buses due to road geometry. Road and city planners are simply not engaged with, or not giving priority to public transport traffic in as many areas as PTAs would like to serve.

Small scale public transport providers in Rural Ontario are at risk of bankruptcy due to requirements placed on systems through the Ontario Disabilities Act. These operators simply don't have the capital to do the necessary upgrades, and therefore may have to stop services to exactly the group which the act is trying to protect. This is an interesting example of guidance from a higher authority negatively impacting the sector.

### 5.2.4  Policies

Supportive themes were common to all interviewees in this domain.

All interviewees reported receiving guidance from their provincial government. This is generally done through regional transport planning. Spatial planning and development is supported through the Ontario Growth Plan, which includes transportation considerations, but needs more time for incentives and limitations to come into effect. The provincial authorities can enforce this by providing funding attached to guiding strings. Furthermore, there are strong provincial guidelines to promote cycling all across Ontario. This, in turn, can promote informal initiatives to ride share through the expansion of paved shoulders and points of exchange. The Smart Commute programme falls under the Provincial Ministry of Transportation, so ultimately the provincial authorities have the last say in what gets done, funded, and how actors come together.

Regional municipal stakeholders come together at the GTHA mobility management committee where there is exchange of knowledge, but very little collaboration. Metrolinx provides data, guidance on fare structure, and coordination of services amongst all service providers within the GTHA. Governments in between the province and lower-tier municipalities aren't interested in transit, although they do have goals and ambitions, they do not provide funding or guidance on how to accomplish these.

Safety is the largest societal barrier to reduced dependence on the passenger car in Rural Ontario. In the GTHA congestion and lack of parking impact the user experience, and that is enough to justify inclusion of transport alternatives in policy. No interviewee was able to state that environment is a primary driver.

TransLink, at the time of interview, was waiting for the results of a pseudo-referendum on their funding sources as politically the support for transport was mixed. This means that policies are not currently strongly defined. This illustrates that public transportation is always political and always controversial, irrespective of location.

### 5.2.5  Actors and Structures

Interviewee answers were inconsistent in this domain, likely reflecting the diverse group upon which the supporting conditions depend.

Interviewees observed that there are simply not many other actors to discuss opportunities with within Canada as the profession of mobility management is perceived to be so young and small. Conferences are not common or well attended, and case studies are limited. This has severely limited opportunities for exchange and learning across the country. The exception to this is the network set up by OHCC. It purposefully facilitates sharing and exchange, but does not anticipate that one solution will transfer to another community without significant adjustments.

TransLink engages with different groups and organisations in Metro Vancouver to achieve a number of objectives including funding infrastructure, anticipating demand, shaping attitudes and behaviours, and governing transport appropriately. More partnerships would be developed further if there was capacity for such activities. Milton has worked with a limited sample of private actors to offer passes and deals which are mutually beneficial. Knowledge sharing with higher level public organisations has become a way not only to learn lessons about how to maximise existing resources and acquire ideas cheaply, but also to acquire new funds and partnerships. Partnerships have resulted in a partial funding of the DRT project through Metrolinx, but are not sought outside of the Town's geographic borders. The Smart Commute

programme is based solely on stakeholder engagement and bringing more actors, particularly from the private sector in the GTHA, to the roundtable.

Diverse operating contexts, negatively impact the consistency in approach of actors in the GTHA, Metro Vancouver, and Rural Ontario. The Smart Commute programmes, TransLink and the OHCC have found that there simply is not a consistent way to approach planning, issues, or actors. Outside actors tend to consider the Smart Commute programmes to be unproven, or unneeded if there are no transportation issues at their front door. TransLink's reputation is suffering from friction caused by a lack of internal planning. However, the Town of Milton is able to communicate effectively through the contracts. The relatively more consistent density of demand may be a factor in the Town of Milton's success relative to the other cases.

Mobility management is, in theory, embedded into all practises in Milton, but budgetary constraints have limited its diffusion. Mobility management is currently embedded in TransLink's actions, but not in stakeholders, which is the reasoning behind the desire to promote a legacy in others. Champions are key to the promotion of mobility management, according to all interviewees as there is not place where it is occurring organically or on its own.

### 5.2.6 Integration

Interviewees were fairly consistently supported in this domain. A limited selection of questions drew out replies where clear division between rural and urban areas were seen.

Intermodality is really well supported at TransLink because infrastructure and basic advocacy work is addressed by dedicated staff, and higher level planning is left for higher level managers. In the GTHA intermodality is primarily in relation to getting people on a GO Train, as is supported by the Town of Milton. If passenger trips in the Town of Milton including the GO Train were lost, 1/3 of trips would be dropped. The GO stations are the main interchange of focus, but some attention is also payed to carpooling lots as interchanges between single occupant cars and carpooling, as well as between bikes and cars. Bikes are incorporated into hardware in the Town of Milton, but are generally used for recreation, not commuting

Every interviewee expressed the opinion that push and pull measure should work together and that if you are going to punish one behaviour, you must also provide an alternative. Town of Milton has tried to reward regular travel with discounts and fare subsidies and to limit punishment to specific types of infractions. Fraud and no-shows for bookings are strongly punished, but fare evasion is treated less harshly. This is an attempt to foster a partnership-type relationship with both customers and operators. GTHA has push measures which occur naturally, so there is no need to impose them through policy. Congestion and lack of parking are occurring and organically encouraging people to reduce their car usage.

Use of technology was split along the divide between rural areas, and urban centres. In the eyes of TransLink technology and big data are the next big things in public transport. They will allow much better matching of supply to demand, targeted marketing, and innovative solutions to bring more actors into the umbrella of transportation solutions. The OHCC considers that most forms of technology are not appropriate for residents in Rural Ontario. Residents there do not necessarily have enough income or skills to own smartphones or computers and large areas of the province do not have access to high speed internet or cell reception. The Town of Milton is not using technology strongly in its operations, except with the DRT booking app. Communication is done "manually" wherever convenient.

Mobility management needs to be incorporated into other plans and strategies. It can't stand on its own and be and effective tool. However, integration into land-use planning was consistently poor according to all interviewees, despite theoretically being well integrated. Planners appear not to be aware of the needs of PTAs, or understand their importance in communities. Public transport is not considered a driver for transport. In rural communities informal initiatives are the most powerful source of change in communities. Paved shoulders facilitate multi-modal biking, ridesharing, and walking small distances in ways that formal initiatives might do in a much more costly way. Mobility management is mandated for TransLink to engage with, but there is no specific plan, objectives, or goals associated with that mandate. The regional transportation plan only considers infrastructure.

### 5.2.7 Resources

The supportiveness of aspects in this domain were consistently divided along lines drawn between rural and urban areas. Despite the fact that TransLink's funding was uncertain at the time of interview.

TransLink, at the time of interview had a sizeable team dedicated to mobility management, which might grow or shrink in the aftermath of the pseudo-referendum on funding. There was significant expertise in the organisation, to the point where there are specialists for engaging in mobility management with different actors. Metrolinx is similarly supported by a number of experts working both directly with Metrolinx, and with more regional actors and public transport providers across the region.

In Rural Ontario budgets are extremely tight. Small communities can easily spend 50% of their annual expenditures on roads. Funding is now available in an unprecedented way as grants will be rolling out for mobility management and sustainable transport in Rural Ontario. It is unsure how the expectations placed on that funding will impact those in the OHCC network. For the Smart Commute program, resources are not difficult to come by as return on investment is always clearly documented.

TransLink provides toolkits as a way to reduce the capacity that it needs to support partners is their use of the mobility management concept. Toolkits allow multiple actors to run the same programmes without having to duplicate organisational or planning efforts. Milton takes advantage of toolkits provided by higher level authorities if they are scalable. The benefit to the Town is the potential to save resources, especially as public transport budget is quite tight. There is only one individual assigned to handle public transport in Milton, thus use of toolkits allows maximisation of his time, as well as financial resources.

Smart Commute is undertaking extensive analysis and reporting to ensure quality of programs and services. It is critical for programme evaluation, but also learning about different contextual factors in the region. Often measurement focuses not only on the service provided but the activities and impacts that were prevented, such as greenhouse gas emissions prevented. Quality management in TransLink is being done to a certain extent, but will be expanded as big data and technology become more integrated. No mention of quality assurance was made in Rural Ontario.

### 5.2.8 Remarks on the Supportive Conditions and Chose Framework

It is clear from the above results that despite their successful engagement with mobility management, the interviewees identified several domains in which they were not well or consistently supported. Each PTA was able to leverage the support they received to create favourable conditions for themselves to engage with mobility management. The conditions, programmes, successes and failures of each interviewee varied enormously.

It is also clear that the chosen theoretical framework (the PAIRs scheme, elaborated upon in section 2.1) is an illustrative tool, which can be used to identify many key factors for success and failure. It provides an imperfect picture as the lack of support in several domains can be interpreted in many ways, and does not necessarily present a barrier to engagement with mobility management. For instance, the lack of financial resources has been a driver for the Town of Milton to engage with mobility management in an effort to maximise resources. Therefore the analysis is continued, using the framework as an illustrative tool. The categorisation of services from MOST (2003) (elaborated upon in sections 3.3 and 3.4), also provides a reasonable illustration of projects which PTAs actually engage with.

## 5.3 Comparison of Swedish and International Findings

Those actors interviewed in Canada suffer similar operating conditions to Swedish PTAs in terms of population densities and focus on connection to trains. The primary differences are that Canadians receive strong direction from the province and they can interact with private sector without being in danger of a conflict of interest because they are providing a service to citizens, not to the company. Further lessons include the importance of integration of mobility management as a pull measure to balance out push measures either imposed or developed organically. Lack of resources is not a key barrier in these cases because lack of resources has spurred the development of projects using mobility management.

Mobility management can be engaged with given a variety of basic conditions, as long as mobility management is tailored to the society it serves. For example, car culture is very strong in many of the jurisdictions engaging with mobility management, but it is not a barrier to programme implementation. If cars are seen as an ally and part of intermodal transport, as MOST (2003) suggests, then their use can be an opportunity. An example of this is promotion of carpooling to the GO Train as is encouraged by Smart Commute.

Mobility management must answer the infrastructure conditions available at each site. There is no sense putting bike racks on buses if there is no space on the roads for people to bike. So change must be incremental in nature to allow time for individuals to change their attitudes and behaviours to adjust to infrastructure changes.

There is an important difference between providing mobility and providing access to spaces or locations. Promotion of telecommuting and remote access to offices will greatly reduce the need for transportation in some areas, but passengers may not realise that they have those options. Mobility management is always caught between answering current demand in cost effective ways, and changing attitudes and behaviours. Behavioural change is much more difficult to quantify, and therefore difficult to identify and assess.

# 6 Analysis and Discussion

The following chapter of analysis brings the findings characterising the Swedish system for providing public transport, together with the findings determining the framework conditions for Swedish PTAs, chapter 4 and section 5.1 respectively. They are juxtaposed with the framework of the PAIRs scheme, as explained in section 2.1, and analysed to identify lacunae in the support of and potential sources of leverage to increase the engagement with mobility management.

The first six sections of this chapter respond to the second research question, as stated in section 1.2:

*Do supportive conditions exist for engagement with mobility management in Sweden by public transport administrations?*

The final section of this chapter (section 6.7) respond to the third and final research question:

*How can supportive conditions for engagement with mobility management be improved for Swedish public transport administrations?*

## 6.1 Policy

According to MOST (2003) political framework is critical for the successful implementation of mobility management. Mobility management must be clearly included in policy documents that lead or build strategies and objectives. This is clearly not done effectively in Sweden. Politically transportation has been controversial in the last eight years; the mandate has been shuffled between different national bodies, and ultimately has fallen out of the national spotlight. The legislative framework is in place, but it has not been turned into actionable plans or concrete results. The governance structure in this sector does not lend itself readily to top-down commands as all national organisations appear to only want to take a supporting and guiding role. They will not step into the controversial area of dictating that PTAs or any actor must engage with mobility management or what that should look like.

Personal economics is the most common societal concern raised in the Swedish context. Citizens appear to be most concerned with the impact on their personal finances. Although it should be noted that numerous environmental concerns were mentioned, they were not primary or consistent. Therefore mobility management must address the cost of transportation to match the prevailing societal discourse.

Responsibilities in terms of engaging with mobility management are not clearly designated, however other responsibilities, that directly impact the ability of PTAs to engage, are. This has tied the hands of PTAs as they are unable to access funding or influence actors to promote multi-modal transport, or express their needs in planning exercises. They are simply unable to take on the partnerships, control of timetables and infrastructure at bus stops and train stations, or engage with stakeholders in ways that would promote mobility management either because it is prohibited or because other actors have already taken on those responsibilities.

## 6.2 Actors and Structures

MOST (2003) insists that strategies which successfully promote mobility management have champions anchoring the effort, a cooperative and communitive means of governance internally and exchange on multiple levels, qualified personnel, and a structure that either imbeds mobility management into all activities or that promotes it through a formal devoted mobility management centre.

No champions for mobility management were discovered on the national level. Only two were found among the eighteen PTAs contacted. There is no anchor point currently in Sweden which could be used to launch mobility management on the national scale. There is also a lack of personnel qualified in mobility management currently working at the PTAs. The mobility management concept is seen to be embedded into operations, however so little is done that in actual fact it is only embedded because it is such a small, diffuse, component. These findings are most likely linked to each other and to a lack of capacity in the portfolios of employees working with public transport.

The governance structure of PTAs is not cooperative or communicative. There were very few stakeholders identified by interviewees, and even fewer PTAs who reported communicating their programmes and operations publicly. Public sector stakeholders were always emphasised as the most important. The limitation placed on the interaction between public and private sector actors seems to be a strong barrier to cooperation.

PTAs who are operating in conditions where stakeholders were all on the same page regarding engaging with the concept of mobility management were successful in that venture. However most PTAs were experiencing differences of opinion with even the few stakeholders that they had identified.

Exchange of knowledge regarding any topic amongst different PTAs, and between PTAs and national organisations is limited within Sweden's borders. It occurs through a variety of voluntary networks, and never on the subject of mobility management. Outside of the national borders communication is even less prevalent. Interviewees believed that projects from outside of Sweden would not be transferable to their cases, and thus there was no justification for wasting resources to attend conferences or exchange with other PTAs. Taking into account the wealth of information and good examples that can be found, a sampling of which are in section 3.2, this is not accurate. The interviewee from Uppsala reported great success with using EU tools and MOST (2003) identifies clearly the importance of knowledge exchange, further confirming the inaccuracy of the mind-set.

## 6.3  Integration

MOST (2003) emphasises the integration of several different concepts into mobility management. These include multi-modal transportation, the combination of both push and pull measures in policy, and the integration of technological development, as well as the integration of mobility management into land-use planning and other non-transport related policies.

There are significant barriers in the mind-set of the PTAs to the integration of other modes into their business model. Cycling, walking, and car sharing are viewed as either competing with their business model, or as simply being ways that passengers fill in the gaps of their services. They are not viewed as allies in moving their passengers around. Interchanges are out of the sphere of control of the PTAs as they do not own land, and are not consistently welcome in planning processes.

PTAs felt that they could use both push and pull measures, but that they didn't want to. Often it was emphasised that push measures may backfire when there is not a sufficient supply of alternatives. This reflects much more strongly on the lack of infrastructure than on the PTA's mandate or operations.

Technology is already very well integrated into the operations of PTAs in Sweden. There is very strong potential for the information gathered to be used, and information services already offered to be capitalised on to improve communication.

The land-use planning framework needs to be reworked to include both mobility management and PTAs in Sweden. The aspects which have been designed to include mobility management (the Four Step principle) appear to have been replaced or worked around with new planning mentality and problem solving techniques. More actors from kommuner must be encouraged to engage with the PTAs as part of their mobility management projects.

While public health could be a champion for mobility management, the actors have not been influential or supportive of the concept or public transport in general. This is unexpected as PTAs and public health are both governed and financed by landsting. There is enormous potential for synergies and collaborative initiatives to promote both groups, however the potential remains untapped.

## 6.4  Resources

MOST (2003) describes important resources as being knowledge, long-term financing, information and guidance, and resources in terms of legal support. It also distinguishes a high level of service quality as a resource needed for mobility management, emphasising the importance of providing alternatives to passenger cars.

Awareness of mobility management tools and the concept is limited in Swedish PTAs. The primary complaint of national organisations was that no PTA has taken on major projects in mobility management, and so it isn't proven in Sweden yet. However, Table 5-3 shows that this is not the case. It is the lack of communication and knowledge exchange, coupled with a lack of awareness regarding the concept, that is creating the illusion that nobody is "doing mobility management", when actually many actors are engaging in a variety of mobility management initiatives. If projects such as DRT, system optimisation, and information and communication techniques were correctly identified as being part of engaging with mobility management then this would help to dispel the myths surrounding the lack of implementation.

PTA budgets appear to be heavily influenced by political priorities, and thus long-term financial support is difficult to rely on. This is especially true when considering the lack of awareness regarding the successful implementation of mobility management in Sweden.

Quality management in public transport service provision is an area which needs to be strengthened in Sweden. There is simply too little ongoing. As national actors are already involved in data collection and analysis, this is potentially an area for them to strengthen their mandate and actions.

Strength through legal resources are also lacking in Sweden. While there are processes and principles in place that should bind actors to engage with mobility management, they are not followed, are sidestepped, or have been partially or completely replaced.

## 6.5  Inverse Policies

No policy in Sweden was identified as intentionally undermining the work of PTAs, or the pursuit of mobility management. Those policies that were named by the interviewees, both from Swedish PTAs and other national organisations, certainly impact the operations of PTAs, but do not necessarily affect their ability to engage with mobility management. Other actors are encouraging or subsidising unsustainable transportation options through free parking, unfair tax

subsidies, built infrastructure, unfair taxation on fuel, and other actions which do impact the choices of individuals, but do not necessarily impact the PTA.

The findings strongly indicate that the constraints on PTAs with regards to whom they can interact with is negatively impacting their ability to engage with mobility management. If PTAs cannot develop partnerships with the private sector, or be active in the planning carried out by kommuner, then mobility management will not be able to be a part of their mandate.

## 6.6  Basic Conditions

MOST (2003) emphasises the importance of supplying many alternatives to the single occupant passenger car. Efforts to engage with mobility management are described as "fruitless" (MOST, 2003, pp142) if those alternatives are not in place. Exactly what constitutes a good supply is not explicitly mentioned.

Swedish actors did not express that there is a sufficient supply of alternatives. Either there is a genuine lack of capacity, or there is a lack of awareness regarding the way that existing infrastructure could be used. In either case action must be taken to change this perception and situation as a prerequisite to engagement with the mobility management concept.

General transport policy in Sweden supports shifting to a sustainable transport system. However the reality of the implementation of policies and goals has not favoured the use of mobility management, or been perceived to be even across all areas in Sweden. This could potentially be alienating to some actors, particularly in rural areas, who feel left out.

The car culture is strong in Sweden, but public transport is not treated completely as a marginal mode only for those without access to a car consistently. Other modes are becoming more prevalent in the city. This is an indication of both the successful transportation governance of actors in kommuner, and as a reflection of available infrastructure and naturally occurring push mechanisms. The phenomenon of peak car may be being seen in urban centres, but is not yet being experienced in rural areas and should be encouraged there.

## 6.7  Lacunae and Leverage Points

There are a number of lacunae in support, and potential sources of leverage described in the above sections. They are condensed in this section, and here extracted from the structure of the PAIRs scheme framework.

### 6.7.1  Lacunae

The lack of *political will* to push mobility management onto PTAs has resulted in a piece meal approach to engaging with it. The Swedish model for governing public transport does not lend itself well to top-down initiatives as evidenced by the fact that there is legislative support for mobility management, but nothing practical. This has also left the mandate of which national organisation should be engaging with mobility management in a vacuum. While this does mean that there is a lack of support from umbrella organisations, it also creates a norm where this need not be a barrier.

*Long term financial stability* is an issue for PTAs. Mobility management is perceived as an unproven concept, and thus is not consistently funded within PTAs. There is no national actor willing to step beyond their arm's-length supportive role. This is particularly true in rural areas, as infrastructure is planned around crowded areas where there are traffic problems as opposed to sparsely populated areas where roads are not yet at capacity.

There are significant issues with *staffing at PTAs*. This was both identified by interviewees across the organisational spectrum, and revealed given the difficulty in scheduling interviews. This creates an atmosphere in which individuals are struggling simply to supply services, and have no room in their portfolios to take on anything in addition to basic operations. As part of the struggle to organise themselves, PTAs have significant cognitive barriers to engaging with anything that isn't procuring public transport. Relationships with other actors, encouraging other modes of transport, and gathering information to better meet current demand are seen as outside of the mandate of PTAs. This is evident when the PTA commitment to The Goal is considered. This is a goal which aims to increase passengers and ultimately PTA revenues, however, there remain eight landsting and PTAs who have not recognised it as they are simply overwhelmed operating as is.

PTAs are *not supported by legal structures* requiring them or other actors to engage with mobility management. There is simply a lack of consistent mechanisms pushing travel out of passenger cars, and pushing actors to implement the utilisation of mobility management.

Operations are not supported through the use of *quality assurance or management techniques*. These would ensure a high level of service delivery, and that public transport is attractive to potential passengers, and are simply not in place in PTAs in Sweden.

There is a *general lack of awareness* among PTAs of what mobility management actually is. This may be due to a lack of expertise on the subject within those organisations and in the umbrella organisations supporting them. There is also a lack of champions encouraging PTAs to engage. It is suspected that these two are linked.

The limitations placed on stakeholders PTAs can engage with means that relationships that could benefit engagement with mobility management are constrained. This is both in the private and the public sector. Potential stakeholders are not consistent in terms of their approach or expectations with respect to relationships with the PTA. This creates an additional *constraint on relationships* as there are significant discrepancies that need to be bridged as part of the beginning of any successful partnership.

### 6.7.2  Leverage Points

Lack of political will has not thus far stopped PTAs from engaging because they do not have to wait for instructions from other organisations. They are *autonomous* enough to engage without instructions to do so.

The *legislative framework is in place* to support and encourage engagement with the concept. Mobility management is explicitly mentioned when considering infrastructure, planning, and operations (Proposition 2001/02:20). The basis for engagement is in place, but this has not transmuted into its incorporation into actionable plans, nor has any strong mandate or budget been allocated for its promotion from the national level. The committee to improve public transportation is an interesting parallel to this. The structure of the committee is in place, and well balanced, however, they have no plans or mandate to spread or enforce The Goal.

Currently PTAs are not aware of how other organisations are engaging with mobility management. Lack of awareness regarding mobility management is a major barrier to engagement. However this is easily rectified with *engagement and education* not only through PTA networks, but also with kommuner and organisations coordinating infrastructure. If communication is expanded and facilitated for all PTAs, then opportunities for learning and exchange will present themselves. Ideally this awareness spreading will break out of the public sector, and into sources of demand outside of the public realm such as employers or major

events. Currently engagement with mobility management in Sweden focuses on public actors, and raising awareness in private actors will open up potential partnerships and prevent demand and strain on the public transport system by anticipating periods of increased demand and allowing for them instead of being overwhelmed or losing potential passengers. As public health and PTAs fall under the same governance body this may be an excellent opportunity to collaborate and develop initiatives transferable to other sectors.

*Personal economics* are what Swedes seem to consider first and foremost when choosing a travel mode. This can be leveraged to attract individuals who might not otherwise consider public transport as an option instead of a car. These factors will shape the manifestation of the peak car phenomenon, and will influence the basic societal conditions in Sweden.

Integration of *technology* is a strength of PTAs and could be capitalised on to work in other areas. Big data could be used to solve the issues surrounding lack of quality assurance. Further expansion of communications systems will raise awareness and serve current passengers more fully. These examples are not exhaustive.

# 7 Conclusions and Recommendations

The following chapter presents conclusions in direct response to the research questions and recommendations developed based on the analysis in the entirety of the thesis. These are divided by actor for the clarity of the reader.

## 7.1 Response to Research Questions

The research questions have been answered to the extent which was possible in accordance with the limitations of the study, and issues inherent in the methodology.

*To what extent is mobility management used today by public transport authorities, or administrations?*

Both within Sweden's borders and outside of them, mobility management is not commonly engaged with by those who procure or provide public transport. Successful examples of specific mobility management projects and of ongoing mobility management engagement do exist both in Sweden and internationally, but they are the exception not the rule.

The Swedish case of low-engagement is not unique. Instances of PTAs engaging with mobility management were difficult to identify internationally, only four were found for interviews. Those projects found ranged in scope and size, both in Sweden and internationally. The Swedish projects covered all but one of the service types identified in MOST (2003).

The projects that had been engaged with in Sweden have not received significant attention within Public Transport Associations (PTAs) networks. Thus it appears from the outside, as well as to those working in PTAs, that there is even less engagement than there is in reality. This is evidenced by the fact that multiple interviewees believed their organisations to have been the first to engage with the concept.

*Do supportive conditions exist for engagement with mobility management in Sweden by public transport administrations?*

According to the analysis based on the PAIRs scheme from the MOST framework some of the supporting conditions required for PTAs to engage with mobility management are in place, however there are many gaps.

It was discovered that it is possible to engage with mobility management successfully without having all of the conditions in place. Both internationally and within Sweden engagement is occurring despite a lack of support, however engagement is currently limited.

Thus the answer to this question has served primarily to support the answer to the next and final research question.

*How can supportive conditions for engagement with mobility management be improved for Swedish public transport administrations?*

Multiple actors in Sweden were identified as being able to facilitate the engagement of PTAs with mobility management. Many lacunae in support were identified, as were many leverage points. Actors in the Swedish context must use the identified leverage points to fill the lacunae in support.

Lacunae were determined to be: lack of political will, lack of long term financial stability, lack of adequate staffing, lack of supportive legal structures, lack of quality assurance, general lack of awareness, and the constraint on relationships of public sector actors.

Leverage points were determined to be: the autonomous nature of actors, the legislative framework which is already in place at a national level, engagement and education not only through PTA networks but also with kommuner and organisations coordinating infrastructure, personal economics when choosing a transport mode, and the integration of technology is already a strength of PTAs and could be capitalised on to work on other areas.

The following recommendations are meant to supplement the response to the third research question. Their intention is to facilitate the enhancement of the conditions for PTAs to engage with all services and aspects of mobility management. They attempt to do this by leveraging strength to fill lacunae. A summary of how the recommendations fit into the PAIRs scheme is in Table 7-1.

*Table 7-1 Shows the fit of recommendations to the PAIRs scheme divisions for each actor mentioned. This table demonstrates the appropriateness of the chosen framework, the variety of actions able to be taken, and differentiation of potential for action for different actors. The numbers in the table correspond to the recommendations listed in the subsections of chapter 7.*

| | Swedish National Organisations | PTAs | Other Actors |
|---|---|---|---|
| Policies | 7.2.1, 7.2.4, 7.2.5, 7.2.6, 7.2.8 | 7.3.5 | |
| Actors & Structures | 7.2.1, 7.2.2, 7.2.3, 7.2.8 | 7.3.5, 7.3.3, 7.3.2 | 7.4.1 |
| Integration | 7.2.6, 7.2.7 | 7.3.5, 7.3.4 | 7.4.1, 7.4.2 |
| Resources | 7.2.2, 7.2.3, 7.2.7 | 7.3.1, 7.3.2, 7.3.6 | |
| Inverse Policies | 7.2.8 | | |
| Basic Conditions | 7.2.4, 7.2.5 | 7.3.2 | 7.4.2 |

It is clear from Table 7-1 that there are actionable items in all domains of the PAIRs scheme, including both direct and indirect ones. National organisations have the greatest potential to act to ameliorate the conditions for PTAs to engage with mobility management. It is also clear that the PAIRs scheme has been an illustrative tool and has brought to light many areas where action can be taken.

## 7.2  Recommendations for National Organisations

There are several National Organisations which could act to encourage and facilitate the use of mobility management. The mandate has not been permanently or exclusively assigned to Samtrafiken, and so while they are the primary audience for the following, they are not the exclusive audience. Trafikverket, Svensk Kollektivtrafik, and others are likely to find that they are able to act upon these recommendations as well.

### 7.2.1  Coordination of Organisations

The various national organisations that support or deal with PTAs must improve coordination to provide a consistent message to the PTAs. If communications and clarifications about policies or how to deal with problems continue to be contradictory from different organisations then any one organisation's efforts to encourage mobility management may be wiped out by another organisation's well-intended advice.

It is therefore recommended that *specific planning and coordination efforts*, such as joint strategic goals, or co-writing of mobility management policies, be undertaken. This will ensure that the message regarding mobility management is clear for PTAs, and roles are delineated between the different organisations. This will require them to engage with each other and ensure that their supportive roles are not being duplicated, or undermined, and that the lacunae identified in this study are filled.

### 7.2.2  Communication Through Organisations

Currently mobility management is in place in legislative framework, and is being utilised in a limited fashion by PTAs, but there is a missing link. National organisations have not promoted the concept or provided guidance to PTAs on how to interpret the legislation to use mobility management to their advantage.

National organisations already run a variety of networks and meetings to facilitate learning and exchange. It is therefore recommended that they feature *a seminar or complete conference on mobility management*. This will address awareness issues in PTAs, and open up opportunities to develop expertise within their organisations. It will break into the feedback loop which is supporting kommuner and no other actors in their engagement with mobility management. This will also present a wonderful opportunity for PTAs to share their projects and experiences.

### 7.2.3  Swedish Platform on Mobility Management (SWEPOMM)

SWEPOMM is, in theory, the link between Sweden and the European Platform on Mobility Management. Currently it is engaging primarily with kommuner, and other actors on the local level. This platform should present an excellent opportunity to discuss mobility management in the Swedish context.

It is therefore recommended that SWEPOMM open up to actors from the PTAs. This will involve both inviting them to the roundtable, but also *targeting their specific operations and conditions* by organising tailored sessions for them. This could become a key platform on which PTAs engage with other actors, but they will not attend unless their role is also represented and they are more than mere partners in the plans of others. This will further break into the feedback loop of support for kommuner, and hopefully foster the same success in PTAs.

### 7.2.4  Plan to Improve Public Transport

Currently The Goal (to double boardings on public transport) is not being supported by a strategic, or actionable plan. This is a significant factor in its not being achieved.

To achieve The Goal, a comprehensive effort from all stakeholders is required. It is therefore recommended that a *comprehensive strategic plan* be developed which includes all stakeholders. It is understood that PTAs, and other actors, are autonomous, and so the committee to achieve The Goal must provide support and guidance without dictating actions. While this may enforce the perception that a plan cannot be developed, it is in fact not a direct barrier to its formulation. It does dictate the sort of measures which may be included in such a plan, and emphasises the comprehensiveness of the multi-stakeholder process which must be undertaken to form it.

### 7.2.5  Inclusion in the Public Transport Improvement Goal

The committee in charge of The Goal has not formally recognised the potential of mobility management in achieving it. Mobility management projects will help to increase boardings without requiring great expenditures on infrastructure.

It is therefore recommended that mobility management be *formally recognised as part of The Goal.* This will not only help to achieve The Goal, but also provide an increased commitment to the concept. Its inclusion would allow PTAs to continue to be autonomous while providing guidance and encouragement to take on their own mobility management projects as part of this common strategic goal.

### 7.2.6  Four Step Principle

The Four Step principle is potentially out of date with regards to the approach used to deal with infrastructure issues faced in Sweden. It is not applicable to the operations of PTAs. The new process of roundtable discussions and stakeholder interactions has not yet formally recognised, or been recognised in, mobility management.

It is therefore recommended that the *new process of roundtable discussions incorporate mobility management* and PTAs. Both mobility management and the new process must be recognised for the important roles that they are playing, and for their inherent interactions. The Four Step principle should not be removed, but its successful inclusion of mobility management must be built off of in the new process.

### 7.2.7  Rural Areas

In Sweden, rural areas often perceive themselves to have been neglected. Funding and attention is directed to problem areas, which are more common in cities and densely populated areas. The Canadian organisation OHCC had success using mobility management to match service levels with demand, and tailor mobility solutions to community needs, preventing excessive costs.

It is therefore recommended that Swedish organisations use their existing networks to promote networking amongst rural areas, by providing *sessions tailored to their operating conditions.* Mobility management can be used to find cost effective means to offer public transport in areas which are not densely populated, if attention is paid to the conditions there. Focus in networking and national organisations must not continue to visibly be only on densely populated areas.

### 7.2.8  Controversy

Transportation will always be controversial. Not a single interviewee implied anything less. However several insisted that the controversy tied their hands and limited their practises because it has to be sidestepped. If anything is to be accomplished, this cannot continue.

It is therefore recommended that controversial issues must be addressed and *differences must be overcome through collaboration.* Continuing to sidestep controversy and conflict will result in continued inaction on achieving goals, increasingly difficult operating conditions for PTAs, and environmental and societal collapse. In essence, dig in before we must dig ourselves out.

## 7.3  Recommendations for PTAs

Each PTA operates in accordance with their governance structure and geo-political circumstances. The following recommendations are meant not to imply that they must change the way they operate or are owned, but to facilitate their engagement with the mobility management concept.

### 7.3.1 Quality

*Quality assurance and management techniques* must be adopted. PTAs must actively work to ensure that the services offered are perceived to be of a high quality for a variety of stakeholders. If PTAs continue to rely on feedback received passively, they are likely to be caught off guard by an issue and will be unable to act to deal with a service disruption or other issue. If more active and preventative techniques are adopted, then they are likely not only to prevent issues before they occur but to attract additional passengers through their services.

MOST (2003) recommends the use of the "EFQM" scheme, however it is up to PTAs to determine which scheme or system is most suited to their available resources.

### 7.3.2 Communication

There are already examples of PTAs engaging with mobility management in a variety of different ways in Sweden. However, their attempts, successes, and failure are not well known among their peers. *PTAs must communicate with each other* on a national level if they are to effectively learn from each other and prevent repeating the same mistakes in each area. That is not to imply that mobility management solutions will transfer seamlessly between areas, but that there are certain common Swedish themes or opportunities which may be capitalised more readily if the experience is shared.

### 7.3.3 Coordination and Openness

Inter-regional trains have forced PTAs to open their timetables and ticket systems to organisations on a national scale and to collaborate with their neighbours. This sort of openness is capable of furthering coordination and promoting inter-regional travel not just on trains but also with other modes. That is not to say that public transport should be planned on the national level, but instead that if the example of trains is followed, *inter-regional transport can be encouraged through coordination*. This will open up potential partnerships and attract new passengers who are interested in crossing geographic borders.

### 7.3.4 Technology

The current success with implementation of technology in information and communication *must be capitalised on to optimise system operations*. Technology is a powerful tool for identifying current operational difficulties and organising service delivery to supply public transport that matches the demand without overspending organisational or operational resources. Big data can be used to learn from past errors, and identify opportunities in traffic flow for improvement of service, and untapped sources of passengers. It can also be used to strengthen the relationship between passengers and service providers.

### 7.3.5 Increasing Boardings

Mobility management must be recognised as part of the process of increasing boardings. It has previously been mentioned that it must be recognised on the national level, and *it must also be recognised by PTAs*. Engagement with mobility management does not require large capital expenditures, and aims to maximise current infrastructure. Its aims align with the goals, and available resources of PTAs.

### 7.3.6 Cost Effectiveness

Engagement with mobility management has been shown by several organisations in this study to maximise resources and be a cost effective means of increasing boardings by enhancing the use of existing infrastructure. As Swedish PTAs are under tight budgetary constraints they must see mobility management as the opportunity it is for engaging with programmes with *high benefit to cost ratio*. Currently interviewees identified a lack of resources as a main barrier, but if they

continue to disengage with mobility management, then they will miss a great opportunity to maximise their resources and reduce their operational strain.

## 7.4  Recommendations for "other actors"

Other actors may include kommuner and the private sector, but is not limited to these. The following recommendations are not limiting or complete in terms of what can be done to engage with mobility management. These focus on what is lacking from others to support PTAs in their engagement with mobility management.

### 7.4.1  Partnerships

Differences in expectations and consistency of approach to solving transportation related issues is a major issue for many PTAs. Other actors can help to relieve this by engaging in partnerships with PTAs to *include them in planning and coordination*. This will prevent both the underutilisation of their expertise and their services being abused or ignored.

PTAs must be brought to the roundtable and engaged with to prevent doubling of efforts or disappointing mismatches between expectations and capacity.

### 7.4.2  Market for Non-Traditional Transport Forms

Swedish PTAs are able to open up and use the private sector to fulfil contracts and provide public transport for their citizenry, they are currently only using buses, boats, and trains to supply that. If they were able to open up their tender process to other modes they will *shift the paradigm of what public transport is and what alternatives are available*. What is procured by PTAs is the ability of people to move around, however what is being provided is the ability to move around on buses, some boats, and trains. Bike rental schemes and car sharing could answer some of the problems of providing public transport in less populated areas without entailing excessive cost.

## 7.5  Recommendations for Future Studies

This study has taken the perspective of PTAs in Sweden, and the recommendations are based on what they need. It has not been assessed how difficult these will be for the actors named to implement. Future studies should investigate the operations of other actors and develop more concrete plans for their work in supporting PTAs, with associated administrative burdens and timeframes for implementation.

The study has conducted a minimalist research into the success that PTAs have already had when engaging with mobility management. How best to analyse and report projects has not been assessed in a structured fashion. Future studies should investigate how best to communicate what was done to engage with the concept, so as to encourage the dissemination of factors for success within Sweden, along with key lessons.

## 7.6  Concluding Remarks

Mobility management is a concept which has strong potential in Sweden. Its usefulness has been proven by kommuner, and its effect is clear with cycling and walking. However it has not been taken up consistently or on a large scale by PTAs despite it carrying the potential to improve relationships with stakeholders and increase boardings.

Therefore, the purpose of this thesis was to determine if the conditions were supportive of the use of mobility management by PTAs in Sweden, and if they can be enhanced on a national scale.

The study has shown that the conditions are not consistently supportive. There are aspects in place that encourage PTAs, but there are also areas which inhibit their ability to engage with the concept. This study has also shown that there are, limited, examples of its use by PTAs in Sweden. These examples prove that there is potential for the concept to be used by this group of actors, in Sweden, despite the mixed support.

The study has suggested a number of ways in which the conditions in Sweden can be improved so that, nationally, PTAs are able to engage with mobility management. These are based on the identified lacunae in support, and using identified points of strength on which to leverage the amelioration of conditions for engagement.

The need to support a modal shift of Swedish transportation away from the passenger car is obvious given upcoming targets and commitments. Public transport must play an important role in helping Sweden to honour international commitments. However, for PTAs to reach their maximum potential, the conditions for engagement must be improved. The enormous potential of PTAs must be harnessed, or else they will simply become another missed connection.

# Works Cited

Bastian, A; Börjesson, M. (2014). Peak Car? Drivers of the recent decline in Swedish car use. *International Transport Economics Association.* V 42 pp94-102

Be Green Umeå. (2015). *Sustainable Travel Made Easy and Fun.* Retrieved from http://en.greencit.se/media/104828/digital_slutgiltig_layman_eng.pdf

Brandt, Christian; Arnfalk, Peter; (2012). Mobility Management Moving In: the journey of integrating MM into decision-making processes in municipalities. In C.M. Carlsson, T. Emtairah, B. Gammelgaard, A. Vestergaard Jensen, Å. Thidell (Eds.), *Rethinking Transport in the Øresund Region; Policies, Strategies and Behaviours* (pp 243-251). Lund: Lund University

Dickinson, J; Håkansson, M; Ljungberg, C; Wendle, B; (2012). Mobility Management – background, progress and state-of-the-art in Sweden and Denmark. In C.M. Carlsson, T. Emtairah, B. Gammelgaard, A. Vestergaard Jensen, Å. Thidell (Eds.), *Rethinking Transport in the Øresund Region; Policies, Strategies and Behaviours* (pp 225-242). Lund: Lund University

EEA (2015). *The European Environment – State and Outlook 2015 (SOER 2015).* Retrieved from http://www.eea.europa.eu/soer#tab-thematic-briefing

EPOMM (2015) *Mobility Management.* Retrieved from http://www.epomm.eu/index.php?id=2590

European Commission. (2015). *Environment Council approves the EU's intended nationally determined contribution to the new global climate agreement.* Retrieved from http://ec.europa.eu/clima/news/articles/news_2015030601_en.htm

Eurostat. (2015). *Europe 2020 indicators - climate change and energy.* Retrieved from http://ec.europa.eu/eurostat/statistics-explained/index.php/Europe_2020_indicators_-_climate_change_and_energy

Eurostat. (2013). *EU Transport Scoreboard: Sweden.* Retrieved from http://ec.europa.eu/transport/facts-fundings/scoreboard/countries/sweden/index_en.htm#prettyphoto[charts]/0/

Freitas, André. (2013). *Green Line: a turning point for public transport in a medium-sized and touristic city, Madeira Island.* Retrieved from http://www.epomm.eu/index.php?id=2771&lang1=en&study_id=3848

Goodyear, Sarah. (2010). *How one Swedish city gets people to trade silly car trips for bikes [Video].* Retrieved from http://grist.org/article/2010-09-29-how-one-swedish-city-gets-people-to-trade-silly-car-trips-for-bi/

International Institute for Industrial Environmental Economics (IIIEE). (2011). *Building Blocks: Six Cases of Strategic Environmental Management.* Lund: IIIEE.

Kepaptsoglou, Konstantinos; Meerschaert, Vincent; Neergaard, Karin; Papadimitriou, Stratos; Rye, Tom; Schremser, Roman; Vleugels, Ilse (2012) Quality Management in Mobility Management: A Scheme for Supporting Sustainable Transportation in Cities. *International Journal of Sustainable Transportation.* V6 pp 238-256

Kim, Junghwa; Fujii, Satoshi; Lee, Backjin. (2013). Strategies to Promote Sustainable Mobility Management Incorporating Heterogeneity. *International Journal of Sustainable Transportation.* V. 7 pp 107-124

Kvale, Steinar; Brinkmann, Svend. (2009). *Interviews: Learning the Craft of Qualitative Research Interviewing.* London: Sage

Ljungberg, C; Smidfelt Rosqvist, L; Wendle, Bjorn; (2015 August 13). "Vi har räknat på vad det samhällsekonomiska värdet skulle bli om kollektivtrafiken i Skåne fördubblas. Hälsovinsterna skulle motsvara 4,5 miljarder kronor per år.". *Sydsvenskan* Retrieved from http://www.sydsvenskan.se/opinion/aktuella-fragor/vi-har-raknat-pa-vad-det-samhallsekonomiska-vardet-skulle-bli-om-kollektivtrafi/

Lund. (2014). *LundaMats - hållbara resor och transporter.* Retrieved from http://www.lund.se/Medborgare/Trafik--infrastruktur/LundaMats---hallbara-transporter/

Lundin, Per. (2004). American Numbers Copied! Shaping the Swedish Postwar Car Society, *Comparative Technology Transfer and Society* v2, pp303–334.

Lunds University, (2009) *Lund University Regulations.* Retrieved from http://www5.lu.se/upload/regelverket/forskning/etiska_riktlinjer_050422.pdf

Majumdar, Sarmistha R; Sen, Lalita; Highsmith, Meredith K.; Cherrington, Linda. (2013). The Case of Performance Measurement in Mobility Management Programs. *Public Performance and Management Review* V 37. No. 2 pp 280-301

Majumda, Sarmistha R.; Sen, Lalita; Park, Sungjin; (2012). The Feasibility of Mobility Management in the United States. *Public Works Management and Policy.* V 18 No. 3 pp 263-278

Meadows, Donella H. (2011). *Thinking in Systems: A ¨Primer.* London. Earthscan.

MFD. (2015). *Kommunuppföljning/ Resultat 2015 / Transport.* Retrieved from http://www.mfd.se/kommunuppfoljning/transport

MOST. (2003). *Mobility Management Strategies for the Next Decades: Final Report D9.* European Commission: ContractNo. 1999-RD. 11129

Naturvardsverket. (2014). *National Inventory Report Sweden 2014 Greenhouse Gas Emission Inventories 1990-2012 Submitted under the United Nations Framework Convention on Climate Change and the Kyoto Protocol.* Retrieved from http://www.naturvardsverket.se/upload/sa-mar-miljon/statistik-a-till-o/vaxthusgaser/2014/national-inventory-report-2014.pdf

Samtrafiken. (2013a). *Tjänster, kunskap och samverkan för Sveriges kollektivtrafik* Retrieved from http://www.samtrafiken.se/om-samtrafiken/

Samtrafiken. (2013b). *Vårt uppdrag* Retrieved from http://www.samtrafiken.se/om-samtrafiken/vart-uppdrag/

Sims R., R. Schaeffer, F. Creutzig, X. Cruz-Núñez, M. D'Agosto, D. Dimitriu, M. J. Figueroa Meza, L. Fulton, S. Kobayashi, O. Lah, A. McKinnon, P. Newman, M. Ouyang, J. J. Schauer, D. Sperling, and G. Tiwari, 2014: Transport. In: Edenhofer, O., R. Pichs-Madruga, Y. Sokona, E. Farahani, S. Kadner, K. Seyboth, A. Adler, I. Baum, S. Brunner, P. Eickemeier, B. Kriemann, J. Savolainen, S. Schlömer, C. von Stechow, T. Zwickel and J.C. Minx (eds.) *Climate Change 2014: Mitigation of Climate Change. Contribution of Working Group III to the Fifth Assessment Report of the Intergovernmental Panel on Climate Change.* (pp599-670) Cambridge University Press, Cambridge, United Kingdom and New York, NY, USA.

Skatteverket. (2015a). *Svar på vanliga frågor* . Retrieved from http://www.skatteverket.se/privat/sjalvservice/svarpavanligafragor/avdrag/privatarbetsresorfaq/jagakerkollektivttillmittarbetevilketavdragkanjagfa.5.10010ec103545f243e80001722.html

Skatteverket. (2015b). *Svar på vanliga frågor - Avdrag* Retrieved from http://www.skatteverket.se/4.18e1b10334ebe8bc80003674.html#h-Avdragforresortillochfranarbetet

SKL. (2015). *Swedish Association of Local Authorities and Regions.* Retrieved from http://skl.se/tjanster/englishpages.411.html

Smart Commute. (2015). *Workplace Program Impact Report.* Retrieved from http://www.metrolinx.com/en/regionalplanning/projectevaluation/benefitscases/Smart_Commute_Workplace_Impact_Report_EN.pdf

Sweco. (2015). *Uppföljning av fördubblingsmålet 2015 Rapport från Partnersamverkan för en förbättrad kollektivtrafik.* Retrieved from http://www.svenskkollektivtrafik.se/globalassets/partnersamverkan/dokument/om-oss/publikationer/rapport-fordubbling-2015.pdf

SWEPOMM. (2015a). *Om Mobility management* Retrieved from http://swepomm.se/om-mobility-management/

SWEPOMM. (2015b) *Om Oss.* Retrieved from http://swepomm.se/om-oss/

Sundström, Anders. (2015, May 21). Kravet på regeringen: en fördubbling av kollektivtrafiken. *DN.* Retrieved from http://www.dn.se/sthlm/kravet-pa-regeringen-en-fordubbling-av-kollektivtrafiken/

Svensk Kollektivtrafik (2015a). *Årsrapport 2014;KOLLEKTIVTRAFIKBAROMETERN.* Retrieved from http://www.svenskkollektivtrafik.se/globalassets/svenskkollektivtrafik/dokument/verktyg-och-system/kollektivtrafikbarometern/svensk-kollektivtrafik-kollektivtrafikbarometern-arsrapport-2014.pdf

Svensk Kollektivtrafik. (2015b). *Medlemmar Aktiva.* Retrieved from http://www.svenskkollektivtrafik.se/Medlemmar/Aktiva/

Svensk Kollektivtrafik. (2015c). *The organisation of Swedish public transport.* Retrieved from http://www.svenskkollektivtrafik.se/in-english/the-organisation-of-swedish-public-transport/

Sverige. Riksdagen. Trafikutskottet. (2014). Järnvägs- och kollektivtrafikfrågor: trafikutskottets betänkande 2014/15:TU13. Stockholm: Riksdagen.

Sverige. Näringsdepartementet (2001). Infrastruktur för ett långsiktigt hållbart transportsystem. Proposition 2001/02:20. Stockholm: Näringsdep.

Sverige. Utredningen om fossilfri fordonstrafik (2013). Fossilfrihet på väg: betänkande. Stockholm: Fritze.

Taniguchi, Ayako; Fujii, Satoshi; Azami, Tomohide; Ishida, Haruo; (2013). Peruasive communication aimed at public transportation-oriented residential choice and the promotion of public transport. *Transportation.* V. 41 pp 75-89

Tørnblad, Silje H.; Kallbekken, Steffen; Korneliussen, Kristine; Mideksa, Torben K.; (2014). Using mobility management to reduce private car use: Results from a natural field experiment in Norway. *Transport Policy* V32 pp9-15

Trafikanalys. (2015). *Lokal och regional Kollektivtrafik 2014.* Retrieved from http://trafa.se/PageDocuments/Lokal_och_regional_kollektivtrafik_2014.pdf

Trafikverket. (2014). *Which authority does what within transportation?* http://www.trafikverket.se/en/startpage/About/Trafikverket/Which-authority-does-what-within-transportation/

Trafikverket. (2015). *Fyrstegsprincipen* http://www.trafikverket.se/Foretag/Trafikera-och-transportera/Planera-persontransporter/Hallbart-resande/Fyrstegsprincipen/

TRIP. (2015). *Project Details: MOSAIC.* Retrieved from http://www.transport-research.info/web/projects/project_details.cfm?id=533

Trivector. (2014). *Underlag till grön resplan för tjänsteresor och arbetspendling inom Region Skåne 2014 Inklusive utvärdering av genomförda åtgärder för ett mer hållbart resande.* Serie nr 2014:79.  Lund, Sweden

Trivector. (2015a). *Green Citizens of Europe project evaluation – Report for period 2010-2014.* Series nr: 2014:107, project nr: 11073

Trivector. (2015b). *Peak car use – biltrafikens utveckling i västvärlden.* Retrieved from http://www.trivector.se/trivectorforetagen/trivector_traffic/produkter_tjanster/hallbara_transporter/peak_car_use/

ULO. (2014, June 5). Branschen byter fördubbling mot förbättring. *Bussmagasinet* Retrieved from http://www.bussmagasinet.se/2014/06/branschen-byter-fordubbling-mot-forbattring/

Vandikkele, Jos. (2008). *Bike service for students 'Velo' (city of Leuven, Belgium).* Retrieved from http://www.epomm.eu/old_website/study_sheet.phtml?sprache=en&study_id=1879

Victoria Transport Policy Institute. (2014). *Online TDM Encyclopedia.* Retrieved from http://www.vtpi.org/tdm/index.php#overview

Wefeing, Frank; Rupprecht, Siegfried; Bührmann, Sebastian; Böhler-Baedeker, Susanne. (2014). *Guidelines. Developing and Implementing a Sustainable Urban Mobility Plan*. Retrieved from http://www.eltis.org/sites/eltis/files/sump_guidelines_en.pdf

Wikipedia. (2015). *Counties of Sweden*. Retrieved from https://en.wikipedia.org/wiki/Counties_of_Sweden

# 8   Appendix A Interview Guide

**Myself:** Anna Barford from Canada studying in Sweden, Masters' student at IIIEE Lund

**IIIEE:** International Institute for Industrial Environmental Economics is an inter-disciplinary institution, focusing on advancing sustainable solutions in the real world. Research and education draw on many different sectors including engineering, natural science, policy, and economics to collaborate and develop concrete actions to meet global environmental challenges.

**Thesis:** Looking at Mobility Management from the perspective of public transportation authorities. What is done in international contexts that Sweden can learn from? Basic premise is that public transportation should become a more important portion of the modal division of personal transportation to facilitate a reduction in passenger car usage.

Do you know the EU definition of Mobility Management?

**Mobility Management (MM)** is a concept to promote sustainable transport and manage the demand for car use by changing travellers' attitudes and behaviour. At the core of Mobility Management are "soft" measures like information and communication, organising services and coordinating activities of different partners. "Soft" measures most often enhance the effectiveness of "hard" measures within urban transport (e.g., new tram lines, new roads and new bike lanes). Mobility Management measures (in comparison to "hard" measures) do not necessarily require large financial investments and may have a high benefit-cost ratio.

**Preamble:** Do you know Trivector? Samtrafiken?

**Trivector Traffic**: offers consulting services, research and development in the field of traffic and transportation. The main tasks we undertake involve analyzing traffic problems with the aim of creating efficient, safe and more environmentally sustainable traffic systems. (Mobility Management Through Mobility Management (MM) we help our clients to promote sustainable transport and manage the demand for car use by changing travellers' attitudes and behaviour with the application of "soft measures". We have worked on many MM projects in Sweden an)

**Samtrafiken**: Interconnection is a service development company that exists to make public transport easier, more accessible and more reliable. We do this primarily by developing services for the carriers and travelers, and to provide the industry with the knowledge and data on Sweden travel.

> **Interviewee**
> 1) Coordinates: Name, position, organisation, length of time there. Email for follow up?
> 2) What is the mandate of and area covered by your organization?
>
> **Location**
> 3) Is there a clearly defined mobility culture in your jurisdiction? (e.g. cycling, commuter, etc.)
> 4) Is there a sufficient supply of transportation alternatives to the passenger car? (question of infrastructure)
> 5) Is transport policy geared towards environmental sustainability?
> 6) What are primary societal concerns in regards to transportation in your region? CC, congestion, noise, etc.?
> **Organisation – internal factors**

7) What is your organization doing to promote and facilitate the use of public transit? (or use MM)
8) What kind of expertise exists in MM in your organization? What sort of qualifications in communication exist in your organization? Is anyone qualified beyond technical capacities?
9) Has any one individual or group championed MM? What kind of human capacity is allocated to MM in your organisation?
10) Is MM imbedded in current structures, or does it stand in its own structure alone?
11) Did you use any resources or toolkits? Are you engaged in any initiatives to exchange and learn from other organizations? Ie do you attend EU conferences on the subject?
12) Do current MM policies reflect multi-modal nature of MM, or are they centered on one type? Do they include cars? Is there a focus on interchanges?
13) How is technology integrated into MM? Are IT solutions used to facilitate information and organisation?
14) What kind of financial support/budget exists for MM in your organisation?
15) Are you using any quality standards or management techniques to ensure high levels of service delivery?
16) Do you have any reports detailing what you did?

**Organisation - outside factors**
17) Are you receiving any guidance from higher levels? EU, national, etc.
18) Do current policies integrate both carrot and stick measures? How does MM fit into that picture?
19) How co-operative is your governance structure? Which other stakeholders do you interact with? How? Are your responsibilities clearly assigned and communicated? How do you interact with other stakeholders (municipalities, national governments, private sector, customer groups, etc.)
20) How consistent is the approach taken to MM by stakeholders? How does that impact co-operation and collaboration?
21) Are you legally bound to engage in MM? Are there any of your stakeholders which are?
22) Is MM integrated in land-use planning? What about non-transport related policies such as health, education, business development, etc.?
23) Have you been affected by economic incentives or shifts (does the carbon tax in Sweden impact your ridership to your knowledge?)
24) Are there any policies which counteract MM initiatives? Are there any policies that encourage unsustainable transportation (e.g. road investments, minimum parking space requirements, tax systems which work against employer sponsored transit passes)?

**Policies – High-level guidance and course of action (**Informative, regulative, economical**)**
**Actors and Structures – people and organisations, agency and exchange**
**Integration – links with transport and non-transport policies**
**Resources – available means and sources of support**
**Basic conditions – fundamentals and starting points**
**Inverse Policies – goals and actions with a contrary effect**
Use P.A.I.R. scheme? Page 146 of most final

# 9  Appendix B – List of Interviewees

*Table 9-1List of interviewees including their role, type of organisation, and date interviewed*

| Type | Name | Role of Interviewee | Date Interviewed | Organisation/Län |
|---|---|---|---|---|
| PTA | Mattias Landin | Developer of Public Transport | 4/6/2015 | Värmland County |
| PTA | Elisabeth Eriksson | Advertising and Marketing | 4/6/2015 | Norrbotten County |
| PTA | Bengt Benjaminsson | Production Manager of Traffic Infrastructure | 4/6/2015 | Dalarna County |
| PTA | Ruth Eriksson | Public Transport Strategist | conducted over email | Jämtland County |
| PTA | Daniel Andersson | Traffic Planner | 5/6/2015 | Kalmar County |
| PTA | Anders Dyberg | Operations Manager | 8/6/2015 | Karlstadsbuss |
| PTA | Karin Edenius | Project Manager | 9/6/2015 | Uppsala County |
| Swedish Context | Adam Mickiewicz | Programme Manager | 10/6/2015 | Energy Agency of Sweden |
| PTA | Per Hallberg | Communications Manager Dedicated to Infrastructure | 11/6/2015 | Stockholm County |
| Swedish Context | Anders Söderberg | Mobility Management Manager in Lund | 11/6/2015 | Lund Kommun |
| PTA | Harriet Classon | Chief Executive Officer | 12/6/2015 | Västerbotten County |
| PTA | Karl Syhr | Planner of Timetables and Routes | 15/06/2015 | Gotland County |
| MM context | Roberto De Tommasi | Owner of Synergo Consulting | 16/06/2015 | Synergo Consulting |
| PTA | Jacob Klasander | Traffic Planner | 6/15/2015 | Västmanland County |
| PTA | Hans Sahlin | Project Leader | 17/06/2015 | Blekinge County |
| PTA | Per Hanson | Infrastructure Planner | 17/06/2015 | Kronoberg County |
| Swedish Context | Mattias Andersson | Responsible for Reporting | 23/06/2015 | Svensk Kollektivtrafik |

| PTA | Frederic Fingal | Public Transit Director | 25/06/2015 | Jönköping County |
|---|---|---|---|---|
| MM context | Marcel Sloot | Advisor to PTAs | 30/06/2015 | Netherlands |
| International Case | Tony D'Alessandro | Coordinator of Transit | 25/06/2015 | Town of Milton |
| International Case | James Lapointe | Senior TDM Advisor | 29/06/2015 | TransLink |
| PTA | Joakim Agartson | Head of Business and Marketing | 17/06/2015 | Skåne County |
| International Case | Lisa Tolentino | Has multiple roles | 7/14/2015 | Ontario Healthy Communities |
| PTA | Annica Kjellin | Chief of Marketing | 1/7/2015 | Västernorrland County |
| PTA | Ylva Bergström | Public Relations, Campaigns and Promotions | conducted over email | Östergötland County |
| Swedish Context | Stefan Sedin | Chair of the Committee | 13/07/2015 | Committee to double public transport boardings |
| Swedish Context | Roland Palmqvist | Public Transport Analyst | 15/07/2015 | Trafikverket |
| International Case | Mark Sadoway and Nadine Navarro | Junior Analyst and Program Head | 27/07/2015 | Metrolinx |
| PTA | Maria Björner Brauer | Sales and Marketing Director | 13/08/2015 | Västra Götaland County |

# 10 Appendix C List of Conferences Researched for International cases.

Table 10-1 shows the results of searching in international databases for successful cases. Only two were found this way. Others were found through contact mining of the supervisors' and author's professional and personal contacts, as well as one suggestion from another interviewee.

*Table 10-1 Results of database search for international cases of PTAs engaging with mobility management*

| Database/ Conference | Retrieved from | Audience/Topic | Cases found/Reason for not extracting cases |
|---|---|---|---|
| JCOMM | http://www.jcomm.or.jp/ | Japanese Actors | Information only available in Japanese, which google does not translate |
| ViaejeoPLUS | http://viajeoplus.eu/lists/ | Multi-modal interchanges in cities in Europe, Latin America, China, and Singapore | Found to be more city infrastructure focused instead of MM |
| Association for Commuter Transportation (ACT) | http://www.slideshare.net/ACTnational/presentations/2 | Providing transport for commuters | No cases with PTAs found |
| ACT Canada | http://www.actcanada.com/resources/summit-archives/2014-summit | All transportation actors in Canada | OHCC from 2014 Summit |
| Canadian Urban Transit Association (CUTA) | http://www.cutaactu.ca/en/public-transit/eventsandawards/conferences.asp | Public transport providers in urban centres | Town of Milton from Fall 2014 |
| Transportation Association of Canada (TAC) | http://tac-atc.ca/en/search/node/public%20transit | Transportation actors in Canada | City of Chilliwack (didn't interview due to scheduling) |
| Transportation Research Board (TRB) | http://www.trb.org/PublicTransportation/PublicTransportation2.aspx | Academics and researchers | Information is significantly out of date |

| EPOMM | http://www.epomm.eu/index.php?id=2626 | All actors in EU | Used to identify other projects in EU |
| --- | --- | --- | --- |
| ECOMM | http://www.epomm.eu/index.php?id=2789 | All actors in EU | No cases by PTAs found |
| CIVITAS | http://www.civitas-initiative.org/measures/mobility-management | Cities | No cases with PTAs found where the contact person returned emails |
| ELTIS | http://www.eltis.org/discover/case-studies | Urban actors | No cases with PTAs found where the contact person returned emails |
| European Metropolitan Transport Authorities (EMTA) | http://www.emta.com/ | Metropolitan centres in Europe | Membership was solely cities, no regions and information was available with a membership only |