



Pre-study on sociocultural factors

WP 2, GoA 6

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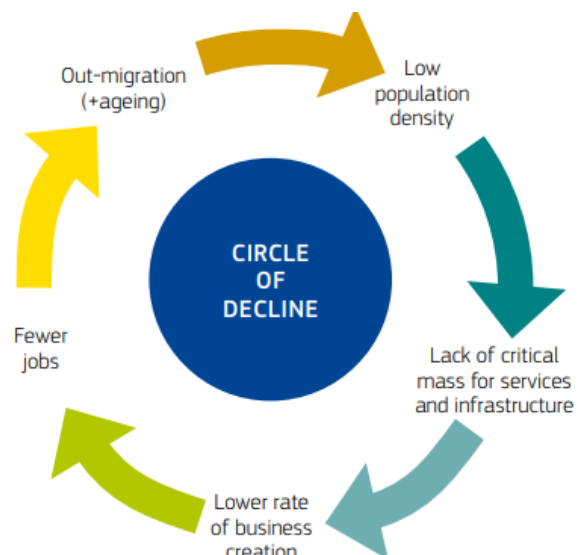
Pre-study on sociocultural factors

Introduction

Rural areas are characterised by long distances and a low population density that makes transport and social services provision challenging and expensive. The challenge of mobility and limited accessibility of services for rural residents is not a new phenomenon, even though it is further aggravated by the public budget cuts, centralization of public services, demographic change and depopulation.

The demographic trends (especially ageing) have increased the demand for certain services, especially in remote and sparsely populated regions. It is not only a question of increasing demand for existing services, but there are also the new kinds of services and mobility solutions that need to emerge (Copus et al., 2016). For instance, with a decreasing and ageing population fewer people use regular public transport whilst there is an increasing number of people who are reliant on the special transportation systems such as hospital and paratransit travels (Regional Council of North Karelia, 2010).

Figure 1. Circle of declining rural areas. Source: OECD 2010.



In a large part of the literature, access to transport is emphasized as a vital factor in increasing competitiveness, sustainability and attractiveness of rural and remote areas by ensuring accessibility of both inhabitants and potential visitors to key services such as employment, education, healthcare and leisure activities (Codatu 2016). **While the key motivations for mobility initiatives in urban areas is reducing congestion and the environmental concerns (e.g. reducing GHG emissions), the focus in rural areas is mainly on the accessibility aspects (OECD, 2009). The key question for rural areas is how to increase mobility of all residents regardless their socio-economic and health status, in a cost-effective way.**

Accessibility of services is another factor that is critical to the well-being of rural residents and the social and economic resilience of communities (ENRD, 2017). Poor accessibility to services is among the factors leading to the marginalization and peripheralization of the territories. It may result in both decline in the economic activity and potential, and low levels of socio-economic performance (low levels of well-being, or quality of life, out-migration, demographic ageing, economic and social stagnation).

Improving mobility and accessibility to services in rural areas are central responses to the challenges that rural regions are facing, and are important for breaking the 'circle of decline' that many rural areas are locked into (OECD, 2010) (see Figure 1).

The emerging solutions for rural mobility are a combination of both social, digital and institutional innovations and are generally focused on novel and flexible forms of mobility and shifting a paradigm from car ownership to vehicle usage (e.g. car and ride sharing). Local people and non-profit organizations are at the forefront of innovative approaches to service provision and mobility solutions. They often act as providers of solutions in the absence of state or market alternatives and are particularly influential where there are strong civic cultures (ENRD, 2017).

Aim and scope

The pre-study on sociocultural factors is one of the outputs of the MAMBA project funded by the Interreg BSR Programme 2014-2020. The overall aim of this pre-study is to explore how different sociocultural factors may act as enablers and / or barriers for the successful uptake of innovative mobility solutions in rural areas. Furthermore, the key lessons learned from addressing the sociocultural aspects in developing and implementation of innovative rural mobility solutions will be reviewed and highlighted.

Report overview/aims:

PART 1: Introduction to sociocultural factors - This section explores rural mobility challenges from different perspectives including sections on individual-related factors, context-specific factors and governance-related factors.

PART 2: A sociocultural perspective on mobility solutions - This section addresses sociocultural factors as they relate to six different innovative mobility solutions: demand responsive transport (DRT); car sharing; ride sharing; mobility as a service (MaaS); combined transport solutions; and service to people. Each section provides a detailed description of the mobility solution, outlines the relevant sociocultural considerations, highlights what works and why and gives a summary of the common barriers to success in implementation.

PART 3: Towards a "road-map" for planning rural mobility solutions (sociocultural lens) - This section brings the other two parts together in as simple, brief snap-shot.

The pre-study is mainly based on the desk research, including both academic literature and other relevant sources, such as project reports on the issue. The further input to the pre-study was provided through qualitative interviews with selected authorities and representatives of innovative rural mobility initiatives.

The pre-study is work-in-progress and will be updated based on the feedback and learnings provided by the project partners after the implementation of the pilot projects.

PART 1: Introduction to sociocultural factors

The capacity to be mobile can be understood as being produced within a prevailing economic, political, social and cultural context (Walks 2016). As such, this project takes a broad approach to sociocultural factors, incorporating individual-related, context-specific and governance-related factors. **Individual-related factors** can be understood as factors specific to the individual people, for example, age, gender, attitude, lifestyle, socio-economic status. A transport authority or municipality is likely to have limited control over individual-related factors however it is still useful to understand how these factors influence travel behaviour when planning mobility solutions. **Context-specific factors** refers to country and location-specific preconditions, for example, cultural and economic conditions, geographic specificities, perceived and genuine safety concerns and mobile network and internet access. Understanding these factors is vital to designing mobility solutions that will work in a given context. **Governance-related factors** can be understood as the political and administrative environment, including coordination within and between different levels and branches of government, cooperation between government and other types of stakeholders and availability and stability of funding. In other words, the success of rural mobility solutions also depends on how the transport and mobility issues are steered and organised at the local, regional and national level. The instruments that are available for the public authorities to promote rural mobility solutions (e.g. public procurement, car fleet sharing, funding support) will be briefly described. Part 1 addresses each of these three elements in turn, drawing on academic literature and other sources. Its primary aim is to provide a basic introduction to sociocultural factors that will complement the discussion of specific mobility solutions in Part 2.

Individual-related factors

Individual-related factors can be understood as factors specific to individual people. While these factors are likely to be largely beyond the control of a transport authority or municipality, it is still useful to understand how they influence travel behaviour when planning mobility solutions. This section covers a range of individual-related factors with the potential to effect mobility behaviour including sections on socioeconomic status, gender and household composition, young people, elderly people and attitude and lifestyle factors. It first presents a short description of the key considerations relevant to each group, both in a general sense and, where possible, with a specific rural focus. Following this, it provides a summary of the target groups, the key challenges when it comes to providing mobility solutions to each group and the factors that may motivate the different groups to change their travel behaviour.

Socio-economic status

Socio-economic status affects mobility, with dual car ownership more common in high socio-economic status households and public transport use and walking more common in low socio-economic status households (Haustein & Nielsen, 2016). For poorer households, lack of access to a car may result in real accessibility problems in reaching work, health services and cheap shopping (Jeekel, 2014). The relationship also goes the other way, with higher levels of physical mobility

associated with increased possibilities for social mobility through, for example, access to a wider range of available employment opportunities (Rai & Vega 2012) or the ability to invest in social networks on a greater scale (Jeekel, 2014).

It is important to acknowledge that the relationship between mobility and socio-economic status, though widely accepted, is complex and fluid (Rai & Vega, 2012). High socio-economic status does not always correspond to high levels of accessibility nor does low-socio economic status necessarily mean limited mobility. Individuals with high socio-economic status have been found to have a tendency to choose housing in low-density residential areas far from employment centres and with little access to public transport (Preston & Raje 2007; Rai & Vega, 2012). Similarly, in many rural areas, car ownership is common even among low socio-economic groups (Rai & Vega, 2012). What is important to recognise however is that, even in societies where both high and low-income groups have access to a car and the associated mobility, low-income groups will be more vulnerable to economic shocks such as oil price increases or car repair bills. These groups may also have less access to the social capital resources that determine an individual's ability to call on others for help, including a lift in someone else's vehicle, or borrowing a vehicle when necessary (Walks 2016).

Gender and household composition

Women and men are likely to have different attitudes towards different modes of transport, as well different mobility needs and travel patterns. Generally speaking, men are more likely to favour the private car and women are more likely to walk or take public transport - even in rural areas (Limtankool et al, 2006; Miralles-Guasch et al, 2016). Interestingly, one study found that women who associate driving with enjoyment, feelings of status, autonomy and safety reported similar levels of car use to men (Bergstad et al, 2011). This suggests that it is perhaps not gender, but rather attitude to driving that predicts car use (see below section on attitude and lifestyle factors). Age also plays a role, with older women the group least likely to be mobile (Miralles-Guasch et al, 2016).

Household composition has also been found to affect transport behaviour, for example, having children in the home. Based on interviews with 106,091 individuals aged 16-29 years in Catalonia, Spain, about their everyday mobility, Miralles-Guasch et al. (2016) found that, although men are more likely to be mobile than women, women who are mobile take more trips. This is most pronounced in middle-aged adults and is likely due to the combination of employment and parenting responsibilities at this stage in the life course (Miralles-Guasch et al, 2016). In fact, the presence of children has been found to increase the likelihood of car use for both genders (Bergstad et al, 2011; Limtankool et al, 2006).

Young people

Age plays an important role in determining the choice of transport mode and the uptake of innovative mobility solutions. For young people, particularly those under the age of 18, accessibility is shaped not only by the transport options available to them but also by real and perceived safety concerns – both their own and those of parents / guardians (Jones et al, 2000). Evidence suggests that these concerns have grown in recent years, limiting young people's independent mobility and resulting in a

growing trend of ‘ferrying children by car’ (Jones et al, 2000). Notably, safety concerns have been found to be less pronounced in rural areas (Jones et al, 2000). Here however, the distances involved and lack of transport options may be a greater factor limiting young people’s independent mobility.

For young people whose parents are not often around or for those whose parents do not have access to a private car, lack of mobility may limit social and recreational opportunities. This in turn affects their ability to develop the social and occupational skills that are an important part of adolescent development. The journey itself may also be seen as valuable by young people if it provides an opportunity to socialise with friends (Jones et al, 2000). Even once they reach the legal driving age, young people are the group that represent perhaps the most scope for change. Their behaviours are less likely to be fixed, they (generally) have less access to resources to enable regular private car access and they are more likely to be responsive to new types of solutions, including those reliant on technology, than older people.

Elderly people

Given Europe’s aging population, the mobility of those over 65 years is of growing interest to researchers and policy makers (Haustein and Siren 2015; Haustein 2012; Ahern and Hine 2016). This is a particular challenge in rural areas given the increasingly high shares of older citizens that make-up rural communities (Corpus et al, 2017). Berg and Thoresson’s (2017) international literature review on mobility and transport solutions in rural areas highlighted the elderly as a particularly vulnerable group due to the limited access to activities and services they experience once they cease driving. For example, a study by Ahern et al. (2010) on the mobility of the elderly in rural Ireland found that, although the car is a preferred mode of transport for older people, those who do not drive are often reluctant to ask for lifts for “non-urgent” trips (social and non-food shopping). Thus, those who are reliant on lifts from neighbours and family may experience limited opportunities for social interaction with subsequent effects to their well-being. The authors conclude that alternatives for the elderly should more closely match what is provided by the car (door-to-door, 24-hour service).

Despite some commonalities, it is important to recognise that older people are an increasingly heterogenous target group with respect to their transport preferences, behaviour and motivations (Haustein 2012). Based on a systematic review of studies which attempt to categorise older people based on a combination of demographic, health-related and transport-related factors, Haustein and Siren (2015) identified four generic groups. **Affluent mobile drivers** are described as highly mobile, highly car-oriented people with high incomes and good health. This group tend to be younger and are more likely to be male. **Transport service-dependent seniors** are mostly depended on public transport, walking (if their health status allows) or on getting a lift from someone. Older women are more likely to fall into this category than older men as are those from low-socioeconomic backgrounds. **Car-dependant seniors** rely on the car predominantly for health reasons but have low level of resources and thus may not always have access to a car. People in this group tend to have negative attitudes or lack of ability to use public transport and do not enjoy walking. They appear to be overrepresented in rural areas, though geographical factors were not considered in all studies. **Mobile multi-modal seniors** are active but without being car dependent (Haustein & Siren 2015).

The dependence of older women on public transport or getting a lift from someone can be explained, at least part, by the fact that women over 65 years are currently less likely to hold a driver's licence than men of the same age (Haustein & Siren 2015; Haustein 2012). It may also be an indirect result of lower levels of financial independence (Haustein 2012). As such, it is possible that these gender differences will reduce with subsequent generations, resulting in higher instances of private car use among older people in the future. With respect to accessing information about transport, it is worth noting that ICT use has been found to be highest among the affluent mobile group (91% have mobile phone and 74% internet access) and lowest among those reliant on transport service (58% / 24%) (Haustein 2012). In other words, those who are most comfortable using technology are also those who are most likely to be mobile. When it comes to the barriers to using transport services by the elderly, inappropriate marketing and advertising of services that is not sufficiently adapted to the needs of this target group was identified as an important barrier, in addition to health and other age-related issues (Berg and Thoresson, 2017).

Attitude and lifestyle factors

At the individual level, attitude is important when choosing a mode of travel. For example, people's attitude to cycling, depends on their lifestyle, their personal circumstances, whether they have access to a car, and the social norm. One study found that differences in cycling frequency can be explained by variables that go beyond the provision of cycling infrastructure and include norms, beliefs and meaning (Haustein & Nielsen 2016). Environmental concerns can also be a strong motivator, however for most groups will be outranked by convenience (for car users), price (among those who favour PT and walking) and practicality (cyclists) (Haustein & Nielsen 2016). A busy lifestyle is also a factor, resulting in mobility decisions driven by the desire to reduce stress and combine multiple purposes into a single trip (Jeekel 2014). In this case, the likelihood of car use is high, even among individuals who would describe themselves as environmentally conscientious (Haustein & Nielsen 2016). As noted above, the make-up of the household is also a lifestyle factor that will influence modal choice with households with children using the car more than households without children (Bergstad et al, 2011).

When it comes to choosing a car as a mode of transport, research shows that convenience is only part of the story. For many users (particularly men), the car is associated with freedom and feelings of strength, power and skill (Jeekel, 2014). There is an abundant literature on the role of car as a means of transport in rural areas (e.g. Gray et al., 2001). Scholars have distinguished between 'structural' dependence on a car and reliance on the car. In the case of 'structural' car dependence, individuals have obstacles to free choice due to contextual or external factors (e.g. lack public transport or individual attributes such as age of having a disability) (Mattioli et al., 2016). Others simply develop reliance on the car because they can afford it and because they feel that they have a poor access to the public transport. Habit also plays an important role in travel-mode choices, meaning that an action often takes place without considering other alternatives. Many studies show that the power of habit is particularly strong when it comes to car use (Berg, 2016; Bamberg et al., 2003; Carrus et al., 2008).

Road users are often more resistant to changing to a different travel mode, and the resistance is greater if there is a previous habit.

In rural areas, high levels of car use among some groups may have knock-on effects for others (Brake and Nelson, 2007). For example, it may reduce the overall demand for public transport, resulting in cuts to services. This has serious consequences for groups without access to other forms of transport, with the elderly, young people, people with disabilities and low-income households most likely to be affected (Brake and Nelson, 2007). Thus, increased car usage contributes to undermining trade, services and public transport in rural areas, which leads to isolation of residents without access to cars. Accessibility to rural services and trade needs to increase in parallel with efforts to increase sustainable mobility, and increased fuel taxes often hit those who already have a hard financial and have no alternative than a car (Berg and Thoresson, 2017).

Summary of individual-related factors

As demonstrated above, the individual-related factors that impact mobility in rural areas are both numerous and complex. While simple categories like 'elderly', 'youth', 'men', 'women' may offer some insight into travel behaviour, it is equally important to acknowledge the diversity that exists within these categories. For example, despite being retired, a 68-year-old man in good health may have much more in common with a younger man than with a 79-year-old woman in poor health when it comes to transport behaviour. Similarly, two couples with a similar income may behave quite differently depending on whether they have children or not. While a young person with a physical disability may have similar motivations to other young people when it comes to social activities and the need to attend school, their mobility requirements are likely to be different. With this in mind, Table 1 shows a number of potential target groups, attempting, where possible, to take into account the interaction of the characteristics described above. The table then lists the key challenges associated with developing mobility solutions targeted to this group followed by considerations that may be useful in motivating this group to change their travel behaviour. These target groups will be revisited in Part 3, in the context of the mobility solutions presented in the next section (Part 2).

Table 1. Impact of individual factors on transport behaviour for different sub-groups

Example target group	Key challenges	Potentially motivated by
<i>High-income, one or two-car household</i>	Accustomed to high level of flexibility; less likely to be motivated by financial savings	Environmental concerns; desire/need for efficiency; Increased access to social and/or economic activities; increased flexibility/autonomy
<i>Low & middle-income, one or two-car household</i>	Accustomed to high level of flexibility	Financial savings; Increased access to social and/or economic activities
<i>Low-income & middle-income, no-car household</i>	Lack of resources	Access to social and/or economic activities

<i>Single men (young)</i>	High car dependence	Environmental concerns; access to social opportunities
<i>Single men (older)</i>	High car dependence; strong habits formed	Financial savings
<i>Single women (young)</i>	Safety concerns	Environmental concerns; access to social opportunities
<i>Single women (older)</i>	Lack of independent mobility (if no licence/car); high car dependence and strong habits formed (if licence/car).	Access to social opportunities; financial savings; increased independence
<i>Couples with children</i>	Time poor; need for high level of flexibility	Environmental concerns; financial savings
<i>Single parents</i>	Time poor; need for high level of flexibility	Financial savings; access to social opportunities or support (e.g. though meeting with other parents)
<i>Young people (under 18 years)</i>	Safety concerns; may lack any mobility options at all	Desire for independence; access to social opportunities; access to economic opportunities (e.g. part-time job)
<i>Young people (18-24 years)</i>	May have the option of a private car	Access to work or study; access to social opportunities
<i>Young people with disabilities</i>	Exacerbated safety concerns; may lack any mobility options at all	Desire for independence; access to social opportunities; access to medical appointment
<i>Over 65 with good health and high income</i>	Likely to have access to a private car - particularly if male	Convenience; independence
<i>Over 65 with good health and low income</i>	Lacks resources	Financial savings; access to social opportunities
<i>Over 65 with poor health and high income</i>	May require a high level of support; fear of travel	Access to health service; access to social opportunities
<i>Over 65 with poor health and low income</i>	May require a high level of support; fear of travel; lacks resources	Financial savings; access to health service; access to social opportunities

Context-specific factors

Rural areas are highly diverse. Even across a region, rural communities can incorporate vastly different geographic, demographic and economic characteristics. **Context-specific factors** refer to country and location-specific preconditions, for example, cultural and economic conditions, geographic specificities, perceived and genuine safety concerns and mobile network and internet access. Understanding these factors is vital to designing mobility solutions that will work in a given context.

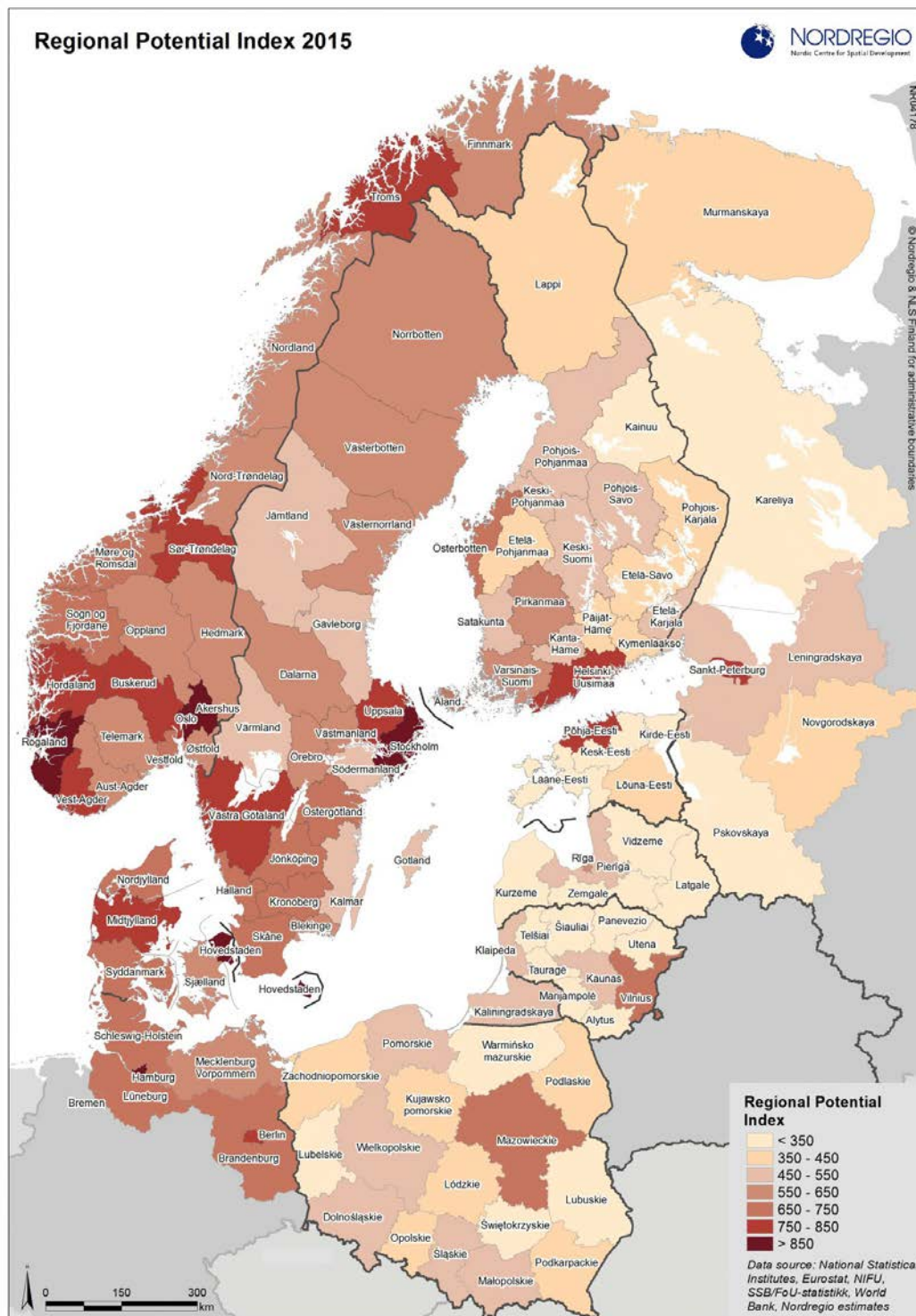
Context specific factors are particularly relevant when planning to transfer a mobility solution from another country, or even region, as solutions that work well in one place may be poorly suited or need modification to be effective in a different context.

Cultural and economic conditions

Even within the relatively small geographic area of the Baltic Sea Region (BSR), there are considerable economic and social differences. These differences are evident within countries, but also between regions. With respect to national differences, Haustein and Nielsen's 2016 research into mobility styles is a useful starting point. Based on Eurobarometer data, Haustein and Nielsen (2016) developed eight mobility styles and used these as a basis for dividing the EU28 into six clusters. The countries in the MAMBA consortium fall into just three of these. In Finland, Denmark and (west) Germany (along with Belgium and the Netherlands), the study found an overrepresentation of both green cyclists (motivated by environmental concerns) and practical cyclists (motivated by convenience) as well as an overrepresentation of green public transport users, green pedestrians and busy green drivers (Haustein & Nielsen, 2016). In Poland and Latvia (along with Lithuania, Estonia, Spain, Slovakia, Czech Republic, Bulgaria, Romania, Portugal, Greece and Croatia) the study found an overrepresentation of price-oriented PT users and price-oriented pedestrians. Finally, in Sweden and (east) Germany (along with Austria), environmental factors dominated with and overrepresentation of green cyclists, green public transport users, green pedestrians and busy green drivers. Although this study did not take into account geographical features, it is likely that these tendencies will be evident, at least to some extent in rural areas of these countries.

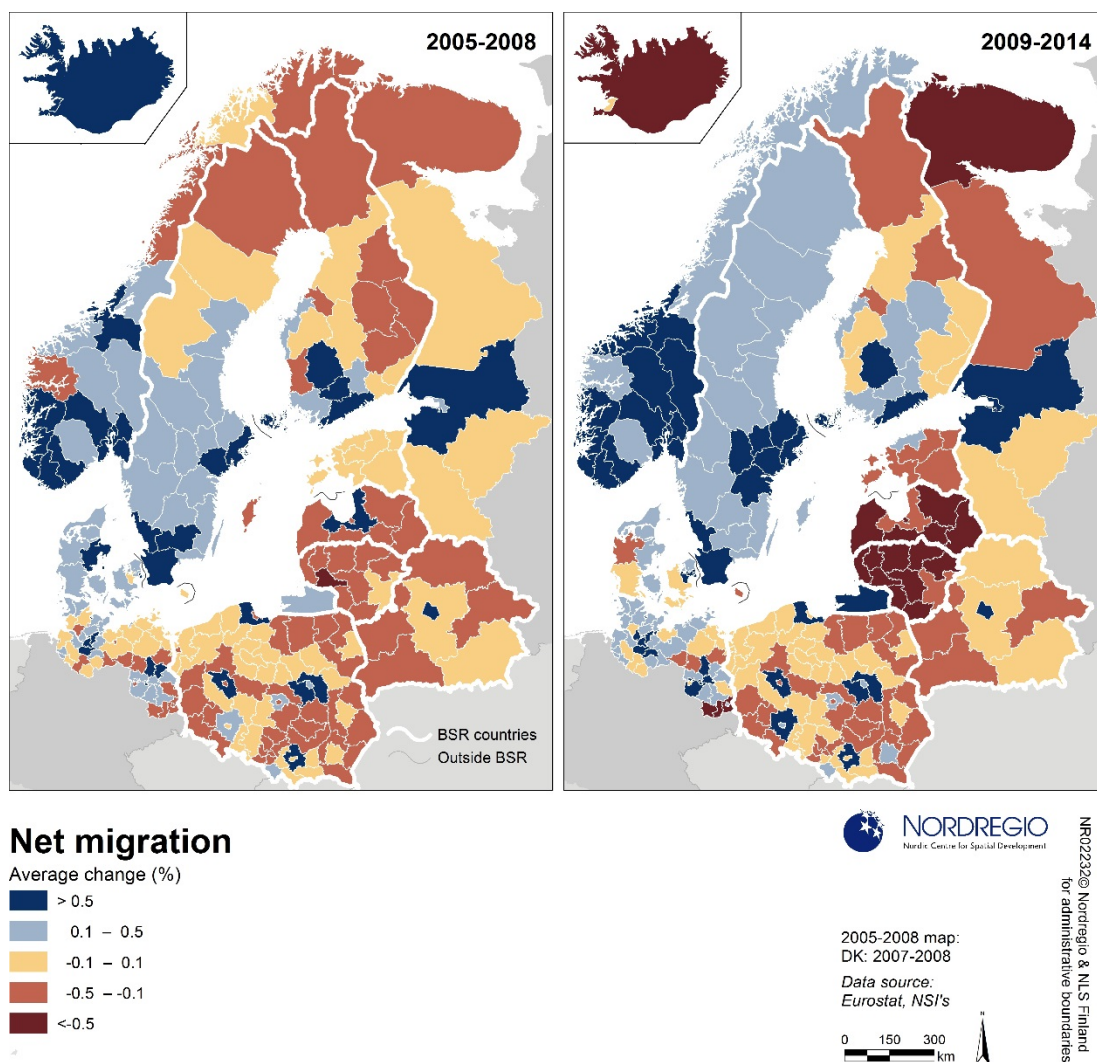
Contextual differences are also evident at the regional level. This is highlighted in Map 1 which shows the results of the 2015 Baltic Sea Region – Regional Potential Index (BSR-RPI). The BSR-RPI is a quantitative measure which aims to highlight the potential for positive economic and social development in different regions (Rispling et al, 2016). It is made up of nine indicators including demographic potential (population density, net migration rate, demography dependency rate and female ratio), labour market potential (employment rate, share of the age group 25-64 with higher education degree, youth unemployment rate) and economic potential (GRP/capita and total R&D¹ investments).

¹ Research and Development



Map 1: Baltic Sea Region - Regional Potential Index 2015 (Source: Nordregio, 2016a)

Migration patterns have also varied substantially between countries and regions within the BSR in recent years. This is highlighted in Map 2, which shows the average change in net migration² from 2005-2008 and from 2009-2014. As these maps show, the populations of the BSR countries and regions have been changing in different ways since 2005. Regions within the Nordic countries and Germany are more likely to have seen positive net migration and the Baltic States are more likely to have experienced negative net migration. In Poland, the trend is more varied, with most regions experiencing neutral net migration or a slight negative trend and some areas of substantial in migration in and around large cities.



Map 2. Net migration 2002-2008 and 2009-2015 (Source: Nordregio, 2016b)

² Defined as the difference between the number of immigrants (people coming to a region) and the number of emigrants (number of people leaving a region) in a given year.

Migrant flows are important to take into account for several reasons. Language abilities may influence the ability or confidence of individuals to access information about mobility solutions (Walks 2016). Feelings of discrimination based on ethnicity or race may also discourage travel on public transport or the use of public forums to arrange travel (Walks 2016). New migrants may also be more reliant on public transport in the initial stages. At the other end of the spectrum, regions experiencing out migration might have trouble maintaining transport services due to reduced demand or shrinking public service budgets.

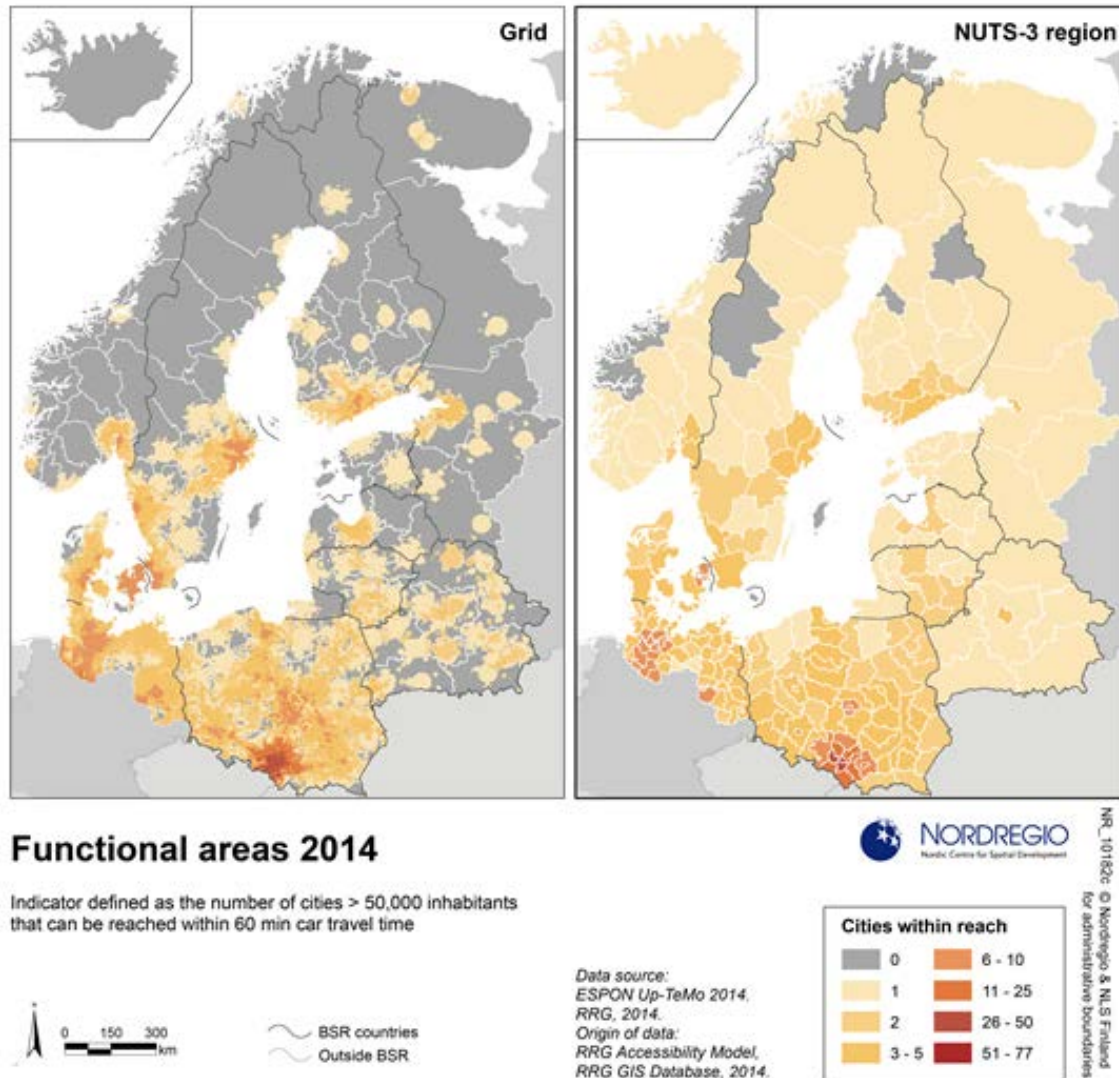
Geographic specificities

The spatial characteristics of territories, for example, remoteness, climate, presence of water bodies, mountains, may have an influence on travel habits. Limtanakool (2006) found that, even once sociocultural factors were taken into account, the spatial configuration of land use and transport infrastructure had a significant impact on modal choice. For example, the success of a ride sharing initiative in Tolg village in Sweden was attributed to the presence of one main regional 'pooling' centre where people tended to commute, as opposed to the villages that have several larger towns in their surroundings.³

Of course, geographic specificities interact with planning and infrastructure decisions to shape mobility outcomes. Providing public transport in remote and poorly accessible areas is costly and difficult. The lack of transport in these areas in turn plays a role in determining the ease associated with using particular modes. For example, in remote and poorly accessible areas of Northern Ireland and Scotland public transportation is poorly developed or even non-existent and, as a result, the car is the most dominant mode of transport (Ahern et al., 2010).

Map 3 provides a general accessibility context for the overall BSR, highlighting the number of cities that can be reached within one hour by car at the NUTS₃ regional level and the grid level. As these maps demonstrate, accessibility looks quite different in the MAMBA countries. In the BSR context, Germany, Denmark and Poland and Southern Sweden enjoy the highest levels of accessibility and Latvia, Northern Sweden and Finland the lowest. Of course, it is important to acknowledge the limitations of an indicator that relies upon car travel as a measure. Despite this, the map does provide some context for the sparsity of different areas within the BSR overall. The geographic specificities of the MAMBA partner regions specifically are addressed in detail in GoA 2.1.

³ Interviews with Pepijn Klaassen (Mobilsamåkning), 22 January 2018, and Hans Arby (UbiGo), 17 May 2018.



Map 3. Functional urban areas in the Baltic Sea Region, 2014 (Source: Nordregio, 2016c)

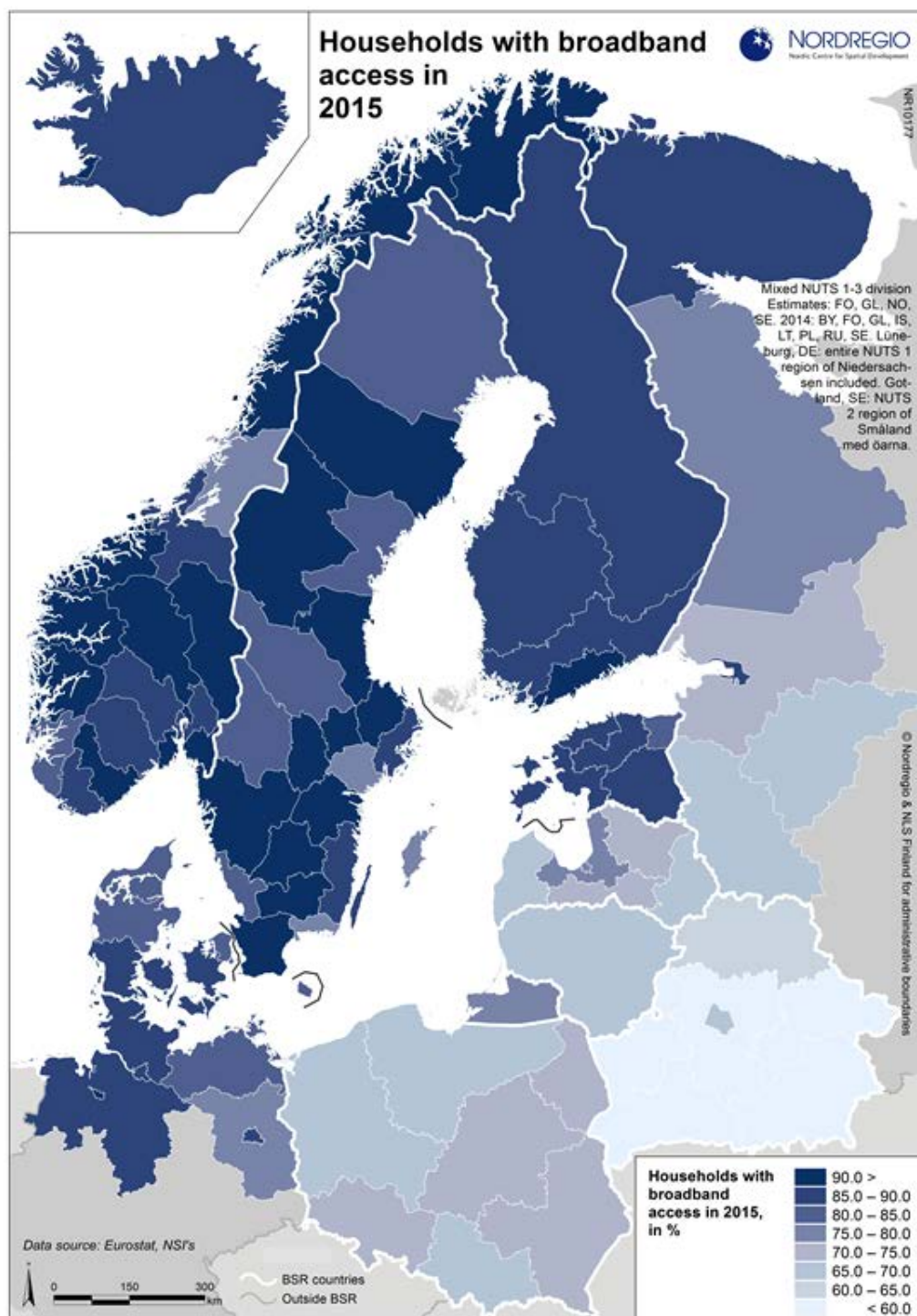
Perceived and genuine safety concerns

Alongside the broader geographical context described above, there are also factors in the immediate environment that will impact transport decisions, for example, safety. Feelings of insecurity in using public transport may relate to both the journey itself (e.g. disorderly behaviour on late night buses) or to walking to, from, or between different travel modes. The degree to which safety will affect transport choices varies, with women, young people and the elderly more likely to have their mobility curtailed due to safety concerns (Jones et al, 2000). For women and young people, these fears are more likely to relate to other travellers whereas for elderly travellers, the fear of falling can also be a deterrent (Haustein & Siren 2015). Safety concerns are also relevant to non-traditional transport solutions that rely on contact between strangers, for example, ride sharing (see Part 3).

Mobile network & internet access

Given the heavy reliance of innovative mobility solutions on online platforms, connectivity is an important context-specific factor. Digital infrastructure is a precondition for developing innovative solutions in the field of mobility, e-health, etc. At the most basic level, it is worth noting that internet connectivity is by no means uniform across the BSR. Map 4 shows the percentage of households with broadband access in 2015 across the BSR. Although there has no doubt been infrastructure developments since this map was produced, the basic pattern is likely somewhat similar today - higher levels of access in the Nordic countries and the lowest levels in Poland and Latvia. It is also important to note that the geographical level shown in the map likely masks poor connectivity in rural locations - particularly in the case of regions with large urban centres. Rural areas are often characterised by a digital divide, referring to adoption rates of innovation, skills and broadband connectivity (ENRD, 2017).

Finally, even where the infrastructure is in place, it cannot always be assumed that all members of a community will have the financial resources and/or the digital skills to ensure access to online platforms. As noted above, those most comfortable using technology may also be those with the highest levels of independent mobility.



Map 4. Households with broadband access in 2015 (Source: Nordregio 2016d)

Governance-related factors

Many of the underlying difficulties in meeting transport and mobility challenges can be attributed to governance issues that span infrastructure planning, policy, regulation, financing, procurement and management (OECD, 2016). Governance of mobility and transport goes beyond the individual level and addresses the structural and organisational questions of how mobility is organised in our society.

There are a number of agencies, organisations and volunteer groups involved in the delivery of public transport, school transport, taxis, community and medical transport in rural areas. Furthermore, mobility and accessibility issues traverse multiple sectors (public, private and third sector), levels of government and policy areas (transport, education, health). In this environment, effective collaboration between different actors, policy areas and interests is needed to effectively govern transport and accessibility (OECD 2017). This calls for collaborative, bottom-up and partnership-based governance approaches. Otherwise there is a risk that policy agendas will fall short of their desired outcomes or, worse, result in poor outcomes.

Low population densities and resource constraints in rural areas make collaboration, innovation and flexibility in local transport a necessity. A simple example could be rescheduling of medical appointments to the times when public transport is available, rather than funding a new transport service. Moreover, collaboration among stakeholders is essential in facilitating the 'policy bending', if not change in policy and regulations, required in the development of innovative rural mobility solutions (e.g. allowing spare seats in school buses to be used by other community members) (OECD 2017).

Local governments are the key players in facilitating and promoting innovative rural mobility solutions through decision making, shaping public space, setting up parking standards, sharing its own fleet with citizens outside of office hours etc. Moreover, they have the ability to communicate directly with potential users (Share North, 2017).

The involvement of local residents is crucial in rural areas, as strategies and mobility solutions need to take into account local problems and opportunities, based on the local knowledge, needs and conditions. Moreover, the mobility solutions are often bottom-up initiatives organised by the residents themselves. A bottom-up approach was found crucial for success of ride sharing initiatives in Sweden and Germany (e.g. Mobilsamåkning and ELLI). The local governments play an important role in providing an enabling framework and support for such initiatives to thrive.

Renting out municipal fleets

By renting out fleet vehicles outside of office hours, local governments can lower their operating costs and promote car sharing. This can also contribute to better social inclusion in a town, e.g. by giving lower income residents access to a car now and then and thus improve the chances for maintaining social contacts or gaining access to different employment locations (Share North 2017).

PART 2: A sociocultural perspective on mobility solutions

This section addresses sociocultural factors as they relate to six different innovative mobility solutions: Demand responsive transport; car sharing; ride sharing; mobility as a service (MaaS); combined transport solutions; and service to people. Each section provides a detailed description of the mobility solution, outlines the relevant sociocultural considerations, highlights what works and why and gives a summary of the common barriers to success in implementation. The content has been developed based on a combination of academic literature, evaluations and reports from other rural transport projects and good practice examples developed by the MAMBA partners. These good practice examples are all based in the MAMBA partner countries and can be accessed on the MAMBA website.⁴

1. Demand responsive transport (DRT)

What is Demand responsive transport (DRT)?

Demand responsive transport (DRT) or transport-on-demand (ToD) refers to public transport services with flexible routing and time table, adjusted according to demand. Travelers make reservations beforehand to optimize routing and traveller frequency. This mobility service is available to the general public with no restrictions based on target group (e.g. age or disability). The fares are charged per passenger and not a per vehicle basis (Wang et al. 2015).

Public transport can be made more flexible in a spatial and a temporal sense through demand responsive services. There are different combinations and variations that help tailoring the right mobility offer for the given surroundings. In a spatial sense the following modifications of traditional line-based traffic can be offered (Karl et al. 2017):

- Only certain stops of a pre-determined route are served depending on a passenger's demand (Line DRT)
- A pre-determined route is complemented by additional stops deviating from the original route. These stops are only served on demand (Line DRT with deviations)
- A corridor is defined instead of a route. Within the corridor stops are only served on demand (Corridor DRT)
- In a pre-determined area, passengers can enter the vehicle wherever they order it, either at certain stops or without restrictions in any desired place (Area DRT, with stops or door-to-door)

In a temporal sense DRT can be offered with or without reference to a pre-determined timetable:

- A timetable contains several possible departure times and the passenger chooses one of them
- The timetable defines the departure time at the first stop and the passenger is informed about the departure time at his stop

⁴ To be published on www.mambaproject.eu soon

- The passenger can freely choose the departure time (Karl et al. 2017)

DRT may be used to provide the entire trip and to complement ordinary public transport services (e.g. last mile travel to /from bus stops). DRT is often offered by voluntary drivers in order to lower the costs for providing the mobility service. Users of DRT generally pay a small fee though services may also be provided at lower or even no cost for low-income earners (Wang et al, 2015). In many cases the service operates with minibuses (less than 9 passengers) but also offering a (citizen run) taxi service is an option that is often chosen.

DRT has grown in popularity in Europe since the 90s and is a rather widespread transport solution in rural areas today. There is an abundance of academic literature on the DRT services in Europe focusing on e.g. evaluation of DRT, the success and failure factors and how the limitations can be overcome (e.g. (Mageean and Nelson, 2003; Nelson and Phonphitakchai, 2012).

Relevant sociocultural considerations

User characteristics are often discussed in the research and are important to consider in planning DRT solution (Mageean and Nelson, 2003; Nelson and Phonphitakchai, 2012). Several studies identified the elderly, people with disabilities, and those with limited financial resources as the main users of DRT services (Wang et al., 2015). In this sense, DRT is a socially-inclusive mobility solution and is a good alternative for people who lack access to cars. Its contribution to community building has also been noted (Nelson and Phonphitakchai, 2012). DRT is found to be particularly useful for connecting isolated communities and population groups to essential services such as healthcare.

Several European studies have found that females are the dominant users of the DRT services (Mageean and Nelson, 2003; Nelson and Phonphitakchai, 2012), and that the average age of users is usually higher than that of the population as a whole (Wang et al., 2015). At the same time, there are sufficient examples of DRT use among diverse age groups to demonstrate that it is possible to tailor DRT to different user groups (Mageean and Nelson, 2003). A study by Wang et al. (2015) on DRT in rural England found that men travel less frequently than women when they are below pension age. However, there are no significant gender differences once they reach retirement age. The knowledge of user characteristics and profiles is important for designing the DRT solutions that are better adapted to the needs of the specific user groups and also for designing strategies for reaching out to the user groups that are underrepresented.

What works and why?

Context-specific factors such as geographic specificities and service characteristics play a significant role in ensuring the success of DRT solutions. Several studies point out that there is a higher demand for DRT in more rural areas with low population density and dispersed settlement patterns, and that the DRT trip frequency would be lower in more densely populated areas (Laws, 2009; Wang et al., 2015).

Moreover, according to Davison et al. (2012), the demand for DRT is higher in areas that are characterised by ageing populations and more varied household structures. A more diverse household structure creates a demand for a much more diverse set of transport options. Based on the analysis

of user characteristics and profiles, Wang et al. (2015) argue that there is an emerging potential to develop the DRT market and product by including 'new' user groups such as work commuters and the retired male. In order to reach out to these new potential customer groups, it is advised that the DRT solutions become more digitally and technologically advanced, incorporating information, purchase, booking and communication functions. Moreover, the research shows that DRT can meet mobility needs of different user groups if the offer is adapted to the demand (certain times of the day when the residents are likely to use DRT). Knowledge about the mobility needs of the residents is crucial in this connection (Berg and Thoreson, 2017).

Brake and Nelson (2007) stress that the key to success of the DRT solutions is a high level of collaboration and strong relationships among the stakeholders and Davison et al. (2012) emphasise the importance of a community-orientated partnership approach. Moreover, several studies indicate that there is potential to increase synergies between DRT and other public transport operators, public services and stakeholders (Ahern et al., 2010; Ahern and Hine, 2015; Davison et al., 2012). This will of course require inclusive and collaborative governance approaches. Linking DRT with healthcare services shows particular potential in rural areas. The study by Ahern and Hine (2015) found that trips to health facilities were the most difficult trips to make in rural Ireland, and that 'there is a need to increase a synergy between transport operators and health service providers, and coordination between government bodies responsible for health policy and those implementing transport policy' (p. 1).

When DRT services are organised by community volunteers, it can help to have at least one highly motivated individual driving the initiative (see good practice example: Amata County Social Service).

There is a lot of focus in the research on the importance of service-related factors (e.g. improving routing, timetable, booking methods, awareness of the service, easy-to-remember phone number, user-friendly service and the role of vehicle types) for increasing the success of the DRT solutions. Service-related factors were identified as the critical success factors for DRT implementation in rural Scotland (Reichenberger et al., 2018). Also, providing real-time information on the DRT was found important (Berg and Thoreson, 2017).

When it comes to the vehicle types, there is some evidence suggesting that taxis provide more cost-effective DRT services in areas with low population and demand, while minibuses work more effectively on semi-fixed routes in more densely populated areas, though it may not be true to all contexts (Wang et al., 2015).

According to the international literature review on mobility and transport solutions in rural areas by Berg and Thoreson (2017), some authors argue that predefined stops work best if the DRT trip is a part of a multimodal travel, as it is easier to plan the travel than if the stops are flexible. The research also shows that DRT solutions work best in places with no or low competition with other modes of public transport (e.g. see Vippari case study).

Common (sociocultural) barriers to success

The users of DRT have generally good attitudes and perceptions of the DRT service against a wide range of factors such as comfort, convenience, reliability, safety and ease of making reservations (European Commission, 2007; Nelson and Phonphitakchai, 2012). The failures of the DRT solutions are more often associated with service-related limitations, insufficient marketing and branding.

Among the most common sociocultural barriers identified in the literature is failure to adapt the solution to the customer needs (Davison et al., 2012) that could be a consequence of the poor knowledge of the mobility needs of the users. According to Davison et al. (2012) lack of market research detailing which passengers are likely to use DRT at certain times increases chances of the service not being appropriate for the market served.

Another common barrier is a poor quality of transport information provided to the residents (Berg and Thoresson, 2017). Berg and Thoresson (2017) stress the importance of real-time information, particularly in relation to delays and other traffic disorders.

A study by Ahern and Hine (2015) on DRT in Scotland and Northern Ireland found that older men see DRT services as being too “feminised”. This suggests that better and targeted marketing is needed to overcome this challenge.

At the operational level the success of DRT schemes may be hampered due to a ‘novelty barrier’, as it is different from conventional public transport and can put people off. Not incorporating sufficiently high levels of technology when providing a complex service has also been a reason for failure in some cases (Davison et al., 2012).

2. Car sharing

What is car sharing?

Car sharing is a form of car rental which is more flexible and easier to use than traditional services. Users subscribe to a service which allows them to rent a car from the fleet as it suits them. Provided a car is available, users can book a car on very short notice and it is also possible to book for very short periods of time. The tariff usually covers all costs, including gasoline and insurance. Reservation, pickup, and return is all self-service, generally administered through a web-site or online application. Typical models for car sharing programs include (Deloitte, 2017):

- Stationary: Pick up and return of vehicles is at the same fixed place; could be pre-booked. This service is often used for longer trips and locally organised. Providers are located in small cities and rural regions (e.g. drivy, Tamyca, Flinkster).
- Free-floating: Allows customers to pick up and return the vehicle anywhere within a certain area; cannot be pre-booked (e.g. car2go, DriveNow). This model allows for a high level of flexibility. The possibility to use it for one-way trips put it in competition with taxis and services such as Uber. This model is most suitable for areas with high population density and would be difficult to manage in a sparsely populated area.

- Peer-to-peer: Individuals provide their own car for rental by private users via a platform. Often used as a transportation mode for longer distances as compared to traditional car sharing. Pick-up and return is the same location, so only return trips are possible. This model is generally used in rural areas and small cities (Deloitte, 2017).

Relevant sociocultural considerations

As an adaptation of an existing model (traditional car rental), car sharing is perhaps well suited to communities where more radical changes may be difficult to implement and in the absence of public transport services. This model allows people to have access to a car while leaving them in control of the timetable and not creating any expectations with respect to social interaction. This may be particularly attractive for people looking to reduce their environmental impact while retaining complete independence when it comes to mobility.

Village buses

Village buses that are available for rent by the village residents is another 'sharing' solution facilitating rural mobility. For example, social shuttle-busses in the municipalities of Beverstedt and Wurster Nordseeküste in Germany are used and run by the members of the village associations. The bus can be rented via the administration of the municipality.

Population groups which have also been identified as potential users of car sharing solutions include socially engaged persons within the local community, persons curious about innovative solutions, persons aware of the cost of owning a private car and economisers (Burkhardt & Millard-Ball, 2016). Furthermore, Matte (2015) have identified two other potential users. The first group is made of persons not owning a car, by choice or by constraint, using public transport when available, see car-sharing as a viable option when public transport is not available, i.e. evening and weekend (Matte, 2015). The second group is made of persons owning a private car who sometimes need larger vehicles such as a van or a small truck. These persons tend to sign in such car/vehicle sharing schemes and end up also using the car fleet.

In small communities with close social relationships, the peer-to-peer model may work well. Alternatively, less tight-knit communities may prefer a model that allows for greater anonymity. Regardless of the type of community, this model relies on having a central, accessible point where the car/s can be parked (e.g., at a Mobility Centre/ Mobility Hub). This may make it difficult to implement in a community where the population, amenities and services are quite dispersed.

A further consideration is the role of technology in the solution. In most cases, car sharing models rely on some form of online platform to handle bookings. Prior to implementing this type of solution, it is important to consider how comfortable your target audience is using such platforms. It is also worth exploring whether the internet connectivity in the area is adequate to make it a viable solution for everyone. In the absence of these preconditions it might be necessary to link the solution to an existing service within the community to allow for a physical booking system. Of course, this will limit the flexibility of the service but it may increase ease of uptake - particularly for social groups who are

less comfortable using technology. For this later group, it is crucial to have a user-friendly application for booking a car (Agerholm & Møller, 2015).

What works and why?

The academic literature and reporting of car sharing experiences in rural Europe have highlighted a number of success factors for the establishment and the longevity of a car sharing.

Matte (2015) and Steger-Vonmetz & Steinweinder (2014) stress the presence of strong local ambassadors who are part of the local community, the so-called “local champions” or “project group of engaged people” as having a vital role in the success of car sharing systems in rural areas. They contribute by sharing their own experience with other inhabitants by communicating the benefits of such services illustrated by personal stories. They also act as a contact person that one can go to in order to gain insight on how to use the system and gain an understanding of what the system includes (e.g. insurance, fuel, etc.). Research comparing two rural areas in Denmark found that the strength of local cohesion and existing local network positively influences the use of car sharing option in rural settings (Agerholm & Møller, 2015) highlighted that point by.

It is not only the local population that should be an ambassador of the car sharing system in the rural areas. According to Maathijs (2017), the local government should also be an active actor to contribute to its success. Its involvement can be done in different ways. It has of course the ability to communicate directly with the local population, face-to-face events being particularly crucial. It should also see the possibility to include their own municipal fleet to the local car sharing system when it is not in use (e.g. evenings and weekends). This solution will contribute to greater use of the existing fleet and could even be seen as a financial resource for the local government if a rental fee is put in place. Furthermore, the municipal fleet often includes a mini-van or a small truck that the local population could use for specific events. In one example, Matthijs (2017) mentions the possibility for the user to not only reserve a car, but to also reserve a driver for people without a licence, resulting in a hybrid mobility solution.

Most of rural Europe is characterised by a lack of realistic alternative to car use. Hence, car sharing rarely replaces the first car in a rural household. However, it can replace the second or third car of the household (Steger-Vonmetz & Steinwender, 2014). Furthermore, the existing social ties in rural areas contribute to keeping the car fleet in a good state. According to Steger-Vonmetz & Steinwender (2014) ‘people sharing a car in a small community know each other, they are all interested that the system works. The loyalty and responsibility taken by the participants is much higher than in commercial systems. Small workings (e.g. cleaning) are done by the members themselves and the operator doesn’t have to pay for it’ (p. 4). A car fleet in good condition and composed of recent vehicles also makes a positive contribution to the success of the car sharing system: it creates an extra motivation for the local population to use such cars (Shaheen et al, 2009).

There are several pilot car-sharing initiatives operating in Belgium which include 4-5 elderly people in a rural area sharing one car. The results show that the elderly trust their own peer group more than

they trust other groups - an important conclusion to be taken into account when planning car sharing solutions (Matthijs 2018).

When it comes to finding the best pricing for rural car sharing systems, experiences in Austria have highlighted that the combination of a high fix costs (i.e. membership fee) and a rather low usage fee contributed to increased vehicle usage (Steger-Vonmetz & Steinwender, 2014). This links the success of car sharing fleet with informing potential users on the usage cost of such cars vis-à-vis a private own car. According to Schaefers (2013), stressing the financial benefits to households increases their motivation to use car sharing systems. The car sharing booking system should allow to plan a trip in advance (i.e. at least 24 hours before), to satisfy the need of potential users. Agerholm & Møller (2015) have shown that a certain planning time is often required for car sharing trips in rural Denmark.

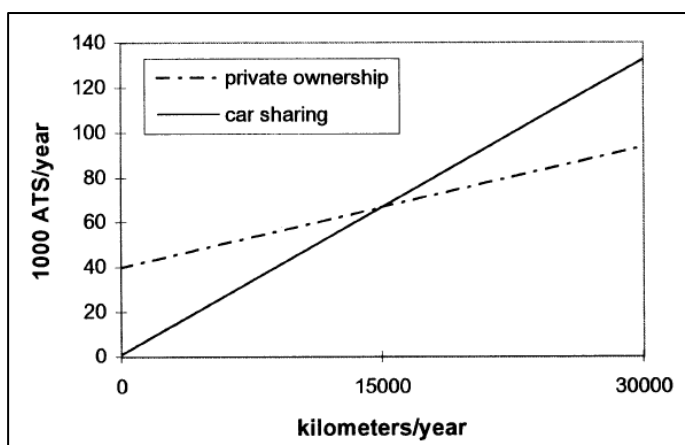
Common (sociocultural) barriers to success

The academic literature and reporting of car sharing experiences in rural areas have highlighted a number of sociocultural barriers for the establishment and the longevity of a car sharing program.

Distances in rural areas tend to be longer than distances in urban areas, reducing the advantage of trips using a car sharing scheme vis-à-vis a privately-owned car. According to Prettenthaler & Steininger (1999), car sharing schemes are more financially competitive than a privately-owned car until a certain annual distance. Figure 2 shows that, in that specific example, the threshold was around 15,000 kilometres per year. The authors pointed out that regular trips such as commuting trips might therefore most likely done by private car, whereas less systematic trips (e.g. leisure trips) for instance might be more suited to car sharing options.

One of the main barriers for participating in a car sharing system in a rural area is the high level of car ownership (Agerholm & Møller, 2015). The flexibility and the comfort of owning a car often provides little room for considering other means of transport, thus limiting the success of car sharing programs in rural areas.

Figure 2 The cost of mileage-service: private ownership versus car sharing (Source: Prettenthaler & Steininger, 1999)



3. Ride sharing

What is ride sharing?

Ride sharing involves sharing spare seats in vehicles with travellers going same direction. Arrangements can be made through a matching service or through informal agreement between friends or acquaintances. The most common model connects drivers and passengers through an online platform which requires pre-registration. Platforms range from as simple as Facebook groups adapted for the purpose to fully tailored mobile-phone applications. The majority of ride-sharing platforms are not-for-profit and are often bottom-up initiatives organised by citizens themselves. In some systems, drivers are permitted to charge a small fee for the ride or, particularly on longer rides, it is common to split the cost of fuel.

Furuhata et al. (2013) developed a typology of the different types of existing ride sharing patterns. They identified four main patterns:

- Identical ridesharing: the origin and the destination are the same for both the driver and the passenger.
- Inclusive ridesharing: the origin and the destination of the passengers are within the trip made by the driver.
- Partial ridesharing: the passenger needs to complement its trip with other means of transport, since the driver carries out only a portion of the passenger's journey.
- Detour ridesharing: the driver is willing to make a detour to pick-up a passenger.

Relevant sociocultural considerations

The evidence on ride sharing in rural Europe from the academic literature is quite limited, with findings either combined with those from urban areas or with car sharing. However, a couple of sociocultural considerations can be highlighted, mostly based on different projects of ride sharing in rural areas in Europe. As with car sharing, ride sharing has also strong potential to both enhancing rural mobilities and increase local ties between potential users in rural areas (Parker et al., 2011; Gray et al., 2001). It has indeed been highlighted in the literature that ride sharing is more common in rural areas with strong local ties and network and especially in the areas where it is common for the people to commute to work, do shopping and leisure activities (Gray et al. 2001).

The motivations for starting up a ride-sharing platform are varied. A study by Parker et al. (2011) found that cost saving and environmental considerations were among the main motivations for the resident in rural U.K. to participate in ride sharing. The sociocultural challenges described in the study were limited flexibility, security concerns that may arise when travelling with someone else, lack of knowledge and information about the available ride-sharing options, as well as lack of knowledge about the legal aspects of ride-sharing. The authors propose several measures through which public authorities could support ride-sharing. The suggested solutions included promoting and highlighting ride sharing in local transport plans and other steering documents, strengthening marketing efforts, developing strategies for monitoring and evaluation, making use of private and public advocates for ride sharing to encourage ride sharing at workplaces, launch demonstration projects. The authors

argue that these types of solutions may play a significantly greater role in rural mobility in future without necessarily requiring so much investment.

In Sweden, for example, the initiators of Mobilsamåkning wished to reduce their environmental impact and increase social interaction within the community by reducing the number of cars on the road occupied by only one person. In Latvia, the Facebook group Valmiera-Riga-Valmiera was motivated more strongly by the desire to offer more flexible and cost-effective mobility solutions. Mobilfalt, in Germany, has a similar motivation.

The geography of the place matters for ride sharing. Ride sharing is more successful in areas where people tend to travel in the same direction, for example, to the regional centre. If there is more than one larger towns around, the success rate may drop.⁵ Ride sharing may be better suited to locations with more dispersed populations than car sharing as the driver can pick up the passenger if necessary. It does however require a somewhat higher degree of trust between the two parties. This can be addressed using different types of security measures, for example, driver's license checks or other approval process, but it is also important that security measures are not so onerous that they deter potential drivers. Based on two successful ride-sharing platforms, Mobilfalt (Germany) and Mobilsamåkning (Sweden) the following target groups are considered most likely to adopt ride sharing as a mode of transport:

- Work commuters, these are *the back-bone* of the ridesharing service
- Kids and teenagers without drivers-licenses/cars
- Green lifestyle pursuers who might recently have left town for the country side
- Villagers with hobbies that require a ride (soccer, music lessons, etc.)
- Retirees with time to help/drive others and the desire to meet people in their cars
- Villagers longing for more socialising and meeting places – in cars and elsewhere

The German initiative ELLI, expands the concept of ride-sharing to include volunteer drivers giving people rides for specific purposes, as opposed to simply because they are going in the same direction. When approached in this manner, ride sharing programs may be ideal for elderly people without the ability to drive to, for example, medical appointments, shopping trips.

In general, about 25 % of the population in a village will start using a ride-sharing service after some initial marketing to encourage behavioural change, such as accepting the idea of driving your neighbours – or to have a neighbour drive your child. This is a conclusion drawn by Mobilsamåkning based on user statistics from 16 attempts to implement their system in Sweden (of which 13 succeeded). This also implies that around 75 % of people in any given community are not interested in ridesharing, in other words, they don't like the idea of driving others or asking others for a ride.

⁵ Interview with Pepijn Klaassen (Mobilsamåkning), 22 January 2018

What works and why?

Based on the best practice examples gathered by the MAMBA team, the key success factors for ride-sharing programs have been found to be:

- Flexible systems, for example, platform that will work on older mobile phones or on a desktop computer, ability for kids to use parents account (Mabilsamåkning).
- Using existing bus stop infrastructure as meeting points (Mobilfalt). Pick-up/drop-off places decided by the users, including the grocery store can also be included in the system by placing the main drop-off/pick-up place outside and increase traffic there (Mobilsamåkning).
- High level of buy-in from local community (Latvian Facebook group Valmiera-Riga-Valmiera; Mobilsamåkning; ELLI). In the case of ELLI this also meant pro-bono support which led to a strong commitment to the solution once it got started. Engaged community members also makes it easy to take a “learn by doing” approach, get ongoing feedback on the service and adjust it to better meet community need. Top-down solutions don’t seem to work so well as bottom-up (Mobilsamåkning).
- Using a familiar platform (e.g. Facebook) makes it easy to grow the network and easily accessible to most people. Also saves substantially on costs (Valmiera-Riga-Valmiera). If there is already a local transport application / platform in place, integrating with this could save a lot of time, money and energy. It also means that the majority of your target audience will already be engaged with the platform and can easily learn about the solution (Mobilfalt). If you do plan to develop the system yourself make sure you have access to the right expertise, for example, an IT person in the start-up group (Mobilsamåkning).
- To create a win-win situation - ride sharing should be cheaper and more convenient than other options (Valmiera-Riga-Valmiera).
- Appoint community ambassadors to inform people about the project (Mobilfalt).
- A dedicated group of individuals to get things started and keep them going.

Since the beginning in 2011, Mobilsamåkning has identified the following enablers or common denominators among villages that have successfully implemented their system/app:

- Villages located quite near (30-50 km) one or two urban centres, but with limited public transport which often has a single concrete mobility need to meet, for work commuters and for high school students.
- Villages with many children taking music lessons or playing soccer or other sports that require recurrent rides at odd times. Ridesharing takes a lot of pressure off stressed parents who otherwise would have to drive their kids themselves multiple times a week, or organise rideshares themselves.
- Villages with many young retirees interested in driving others and socialising with neighbours

- Villages with a fair share of environmentalists, generally urbanites who recently resettled in the country side to pursue a greener lifestyle. These people are often staunch supporters of ridesharing, and are keen to save the planet and to make new friends. They are also less likely to have fixed travel habits related to individual car ownership.

Additional enablers are:

- An easy to use application with payments handled by the system
- High level of safety and security – drivers and passengers in the system are all approved by the village administrator or ambassador.
- Continuous marketing: villagers will need continuous reminders to post their rides and travel needs in the system/app.

Common barriers to success

Key challenges encountered when trying to implement ride-sharing programs in rural areas include:

- Administration can be time-consuming (Valmiera-Riga-Valmiera)
- Poor internet service (ELLI)
- Raising awareness of the solution and attracting new drivers (Mobilfalt)
- Bottlenecks occurring in villages or areas that are very sparsely populated with limited traffic and few daily commutes to an urban centre (e.g. southern Öland). (Mobilsamåkning)
- Villages where most inhabitants have two cars and prefer to drive alone. This is typical in Sweden and probably other countries where people can afford to have two cars and appreciate the freedom and flexibility of driving alone. (Mobilsamåkning)
- Conflicts or conflicting interests in the village that hamper implementation, for example, with small, local taxi companies. This can be addressed by adding taxi reservation as an option on the ridesharing app and explain that it is a different service, always on time. It might still make sense for villagers to order a taxi rather than ride share under specific circumstances, for example, when they have a flight to catch. (Mobilsamåkning)

4. Mobility as a service (MaaS)

What is Mobility as a service (MaaS)

Mobility as a service (MaaS) is a concept that offers multimodal and sustainable mobility services from A to B by integrating planning and payment using a one-stop-shop principle (Aapaoja et al., 2017). It is based on a dynamic data and consumer-defined travel preferences.

“The great vision in the MaaS concept is to connect all available transport and mobility services in a one-stop-shop package and hence provide an agile, sustainable and efficient competitor to private cars, which can be tailored according to the needs of end users” (Aapaoja et al., 2017).

MaaS enables customers to buy a mobility subscription which incorporates different physical transport modes such as buses, trains, taxis, bikes and car sharing in a single app. A desired combination of the types and amount of transport is decided by the user or household (Li and Voegelé, 2017).

MaaS is a new paradigm in mobility, as it promotes a modal shift from private car ownership and encourages users to pay for mobility services instead of investing in own vehicles.

MaaS should not be confused with smartphone based apps that integrate available transport modes and enable multi-modal travel. MaaS apps provide more than just information on various options - they enable the user to meet all their mobility needs through one service contract.

MaaS is a rather new concept that has been mainly tested in the urban context. Among the most well-known cases in the Nordic countries are Whim in Helsinki and UbiGo in Gothenburg. MaaS in the context of rural areas has gained some attention in Finland. For example, Rural-MaaS was a yearlong (2016-2017) national project funded by the Ministry of Agriculture and Forestry. Another MaaS project was piloted in Ylläs area in Finland in 2016 (see text box).

MaaS in rural Denmark is currently in the planning phase by the Transport Authority of Northern Denmark. The new mobile app will guide users to the most convenient and cheapest mobility services available on a selected route from A to B – public as well as private options (e.g. carpools, shared cars, ferries, taxis, and transport-on-demand busses). In a future version of the app, users might also be able to pay the whole trip in one go, regardless of how many service providers are involved. There are still some hurdles before this will become a reality.

According to the CEO of UbiGo, Hans Arby, there is a difference in the societal goal and motivation between MaaS in urban versus rural areas. While the goal of MaaS in urban areas is to limit car ownership and usage, thereby changing peoples' mobility behaviour, the main motivation for MaaS in rural areas is to increase accessibility. Making it possible to live a life in rural areas with one or no cars is of secondary importance in rural areas.⁶

Relevant sociocultural considerations

MaaS is an end-user oriented approach and builds on a good understanding of the customers' (and service providers') needs. Therefore the sociocultural considerations are central for ensuring the success of MaaS (Aapaoja et al., 2017). According to Pöllänen et al. (2017) the demand for a service like MaaS is most likely highest for the segments of the rural population that do not own or use a private car, regardless of the reason. Drivers of private cars tend to be more attached to owning a car than the passengers in private cars, the latter are more likely to be open to a concept like MaaS because it would not mean a great change in their travel experience.

For this reason, the young, aged 15 to 24, were identified as an especially interesting target group for MaaS, as there is a higher chance that people in this age group do not own cars and, even where they

⁶ Interview with Hans Arby (UbiGo), 17 May 2018

do, their travel habits are likely to be less fixed. Older people are more likely to be locked into their mobility practices, making behavioural change more challenging. Given the high share of senior citizens in rural areas it is also important to consider how MaaS could be adapted to serve the needs of this demographic group (Pöllänen et al., 2017).

Data from Finland shows the more than half of households consisting of four persons or more have more than one car in use (Pöllänen et al., 2017). Herein lies a challenge for MaaS – how to make the service attractive for these households. MaaS pilots have shown that MaaS can provide several perceived benefits, such as convenience, flexibility, and perceived increased access to mobility options (Karlsson et al., 2017). At the same time it may take some time to gain acceptance from the end-users (Aapaoja et al., 2017).

What works and why?

MaaS is not a rigid concept and can be adapted to work in different environments. In more rural areas MaaS may need more public support than in areas where the demand for transport is high and the service can be fully commercially exploited (Pöllänen et al., 2017). In rural areas in Finland, MaaS is promoted for its potential to increase the efficiency of statutory social and health service transportation (i.e. trips for disabled and elderly persons) by connecting the organisations responsible for these trips to the MaaS service (Aapaoja et al., 2017). Combining logistics services as well as school and statutory social service transportation together with MaaS is seen to be an efficient solution for future development of rural areas (Aapaoja et al., 2017).

The more personalised approach to mobility services offered by MaaS could benefit residents who find it difficult to use traditional public transport, such as the elderly, people with disabilities or foreigners, by easing access to door-to-door transport provision (Aapaoja et al., 2017). The solutions for MaaS in rural areas should be based on strong social capital and trust between people in smaller localities⁷. This would increase the potential for integrating peer-to-peer car sharing services rather than initiating a commercial car sharing as part of rural MaaS.

It is very expensive for a single transport authority to develop a MaaS system. Moreover, people have high demands regarding the functionality of such service, even in rural areas, meaning that the app must be easy to use. In this sense, having a general technical business platform for MaaS that could be used and adapted to the needs of each municipality could be a better solution (e.g. as is being done by the NT in Denmark, see case study MinRejseplan).⁸

MaaS in rural areas might not develop into a commercial service but it might still result in cost-saving for the public transport authorities through reducing expenditures on public buses and subsidising MaaS instead. A more substantial analysis into the validity of this claim is currently being conducted

⁷ Interview with Hans Arby (UBiGo), 17 May 2018

⁸ Interview with Nicolai B Sørensen (Transport Authority of Northern Denmark), 28 February 2018

as part of a Swedish Innovation Agency funded pre-study on the possible sustainable business models for mobility in rural areas in Sweden.⁹

The key to successful implementation of MaaS in rural areas is the collaboration between businesses, the public sector and citizens in order to achieve a higher economy of scale (Aapaoja et al., 2017). A fully operational version of MaaS would also require a lot of trust between the companies providing the service, authorities, and investors.

Common barriers to success

The general obstacles to the viability of MaaS are mainly of an institutional and regulatory nature. At the individual level, the sociocultural barriers to the adoption of MaaS were found to include efforts associated with having to learn how to use a new service, create new habits and routines (Karlsson et al., 2017).

A clear bottleneck with Ylläs Around application was the technical weaknesses faced during the implementation. The system didn't count the price right, which led to a situation where taxi drivers didn't want to drive those trips (Anttila 2018) (read more: Ylläs Around and YlläsTiketti case study). Challenges in developing a common payment system have also been identified as a barrier in case of MinRejseplan in Denmark. The challenges include, for example, a lack of interest among the different transport providers to share data about their customers, and difficulties in pooling payment systems between private and public actors. The service providers need to be convinced that MaaS will not increase competition. Instead it will increase the number of travellers by making sure different travel modes can be combined¹⁰ (read more: MinRejseplan case study).

Hauptmann (2018) recently made the following interesting observations about the psychological aspects of (mobility) behaviour and MaaS:

- The hypothesis of MaaS is that multimodal real-time traffic information and more predictable travel chains may induce people to leave their cars at home. An important question in relation to MaaS and mobility behaviour is whether extensive information on mobility options and travel chains complicate the decision-making process and may instead lead to a perceived loss of control? Too much information may weaken decisiveness.
- Another question mark is whether a monthly subscription to mobility services is something positive from the user perspective. The user may wonder whether she /he has fully utilised her /his monthly mobility subscription? One opportunity could be to make it possible for MaaS users to save unused mobility for next month.

⁹ Vinnova's Kombinerad mobilitet på landsbygd och i mindre tätorter - förstudie

¹⁰ Interview with H. Ylipiessa (Ylläs Travel Association), 4 May 2018

5. Combined transport solutions

What is a combined mobility solution?

Addressing accessibility and mobility challenges in rural areas calls for an integrated approach that goes beyond thinking in terms of separate modes of travel.

By combined / shared transport and mobility solutions we refer to a variety of different initiatives, such as:

- passenger or private transport used for the transport of goods (see text box);
- goods carrying services offering passenger transportation;
- different combinations of passenger transport (combining specialised public transport and regular passenger transportation).

A combination of different services contributes to cost reduction for service providers and end users, increasing efficiency and providing environmental benefits. Moreover, combining goods / services transport with regular public transport is an effective way to improve service-to-people mobility.

Freelway is an app/service transporting goods between persons (and businesses) in Sweden by using existing rides. As an individual, one can register in the platform and help others to deliver goods and packages. Freelway HIT allows businesses to coordinate their transport of goods and staff via better planning and sharing of rides. Freelway GO is a free app for private persons looking for ride sharing of goods via existing transport carriers in the system.

KombiBus is a bus service that combines passenger transport with freight and post-delivery in Germany (read more: KombiBus case study)

Relevant sociocultural considerations

The success of combined transport solutions depends to a high extent on having good knowledge of the target groups and their needs and preconditions for mobility, since the mobility offers and routes should be adapted to the needs of the users of the services. Moreover, collaboration and coordination among the stakeholders and different policy areas are vital for success, indicating the importance of the governance-related factors.

What works and why?

In their research on accessibility of health services for aged people in rural Ireland, Ahern et al. (2010) and Ahern and Hine (2013) argue that there is a need to increase both synergies between transport operators and health service providers, and coordination between government bodies responsible for health policy and those implementing transport policy. Among the conclusions of Ahern and Hine (2013) was that, with greater communication and cooperation, DRT solutions could be linked to other public transport operators and public services (e.g. healthcare services). Collaboration among the associations (social and health care) regarding sharing of vehicles and transport of patients to doctor appointments and leisure activities could also be further promoted. Furthermore, other research has found that coordinating the timing of doctors' appointments and scheduled public transport services was crucial in the case of the Local Link bus service in rural Ireland (Mc Kenna 2017).

According to an international literature review on mobility and transport solutions in rural areas by Berg and Thoresson (2017), ensuring an increased coordination of special transportation services, public transportation and school buses is an important precondition for developing a well-functioning transport system in rural areas. In several municipalities in Skåne Region in Sweden, for example, the school bus service was combined with regional bus lines to ensure better connectivity. Another example of a successful project was a collaboration between Flexi-bus¹¹ and the Wheelchair Association services to identify users of the latter service who were on the Flexi-bus route. This resulted in cost savings for the Wheelchair Association without extra cost to Flexi-bus. Further, it linked customers to the Flexi-bus service, giving them access to greater mobility than the Wheelchair Association was able to offer (Canny et al, 2010).

“Collect and connect” services provide a permeant pick-up point in a rural town where people can catch a bus linking to a regular commuter service in a larger town (e.g. as part of the Mobility Centre/ Hub). In a U.K. transport project, this type of service was found to be effective only when it could provide several services in the morning and evening every week day and when ticketing could be integrated with the broader system (i.e. the link would be covered under the regular commuter ticket price) (Canny et al, 2010). As a result, the service turned out not to be commercially viable. Lack of facilities (e.g. shelter) at the pick-up point was also found to deter use. Finding other uses for the vehicle during the day was thought to be important in making the service more viable (e.g. on Thursdays and Fridays it operated a “shopper service” (Canny et al, 2010).

When integrating transport services, it is important to take into account that the needs being met by the existing service may be more complex than getting from A to B. For example, an attempt to replace a DRT service with a “collect and connect” service failed because: 1) drivers on the “collect and connect” service were not able to provide the same level of support to passengers (e.g. for those with reduced mobility); 2) passengers were unwilling or unable to access centralised bus stops; 3) the time savings offered by the new services were irrelevant to service users for whom the trip was their only activity for the day - in fact, for many, expediency was a disadvantage as the trip was also seen as a social activity; 4) integrated tickets were not available, meaning passengers had to purchase an additional ticket to use the service (Canny et al, 2010).

In case of KombiBus, the development of a digital platform for ride scheduling and booking contributed to the success of the initiative. With this system, freight capacity of different transport providers can be viewed and connected to optimise the journey. Above all, however, KombiBus’s success can be attributed to the support from various stakeholders at the national and regional level, and an effective collaboration with the local authorities, the regional transport company and the business sector (the manufacturers and producers in the Uckermark Region). Because the project was backed by the Ministry of the Interior, it had a legitimate ‘label’ and was generally trusted by the partners. Another great support came from the first big partners in the region. They acted as multipliers, both showing other potential partners that the project was viable and using their

¹¹ Flexi-bus is equipped to service passengers who use a wheelchair

regional business network to actively look for more partners. Overall, communication, constant marketing, publicity and persuasion were found essential for successful implementation.¹²

Common barriers to success

The authors often refer to legislative barriers as the main obstacles for combined mobility solutions. For example, child protection guidelines can be a barrier to broader utilisation of school transport services (Canny et al, 2010). Governance and coordination-related barriers can also hinder technical and financial integration between mobility operators. General lack of coordination and integration between service providers and policy makers (e.g. health and transport) is also a common barrier.

Governments should be aware of the dangers of piloting integrated solutions without first ensuring that there will be resources available to continue them if successful. Past experience of “short-lived” transport solutions have been found to hinder uptake of new solutions in the future (Canny et al, 2010). It may also take time for people to hear about a solution or gain the confidence to try something new.

In case of KombiBus, the biggest challenges in the pilot phase were convincing the users of the feasibility of the concept and persuading them to cooperate. Although the concept of combined passenger and freight transport has existed before in Germany, the producers and customers were initially sceptical. A shift in thinking was required as producers and customers had a centralised market mindset, believing that goods must be bought at a central market in a medium-sized or large city.¹³

6. Service-to-people

The service-to-people approach aims to increase accessibility to services among the residents in rural and peripheral areas. It is an integrated approach that puts the needs of the inhabitants and the community at the centre, and is designed to enhance quality of life in rural and peripheral areas. Services may be delivered in a combined or single form, physically and digitally, and address particular needs and different population groups. Although service-to-people approach is not a mobility solution, it does increase accessibility to services and thus was included in this study as a separate category due to its high importance to the project partners.

The European Network for Rural Development (ENRD) (2018) identifies three models that can loosely be described as service-to-people solutions (see Figure 3). The first is integrated service delivery, including the co-location of several services in one building or space. The second is alternative and flexible delivery approaches. This includes mobile services, for example, services that move from place to place, serving different parts of the community at different times (e.g. mobile libraries) or services that visit residents in their homes (e.g. meals services for elderly residents) (see example in a

¹² Interview with Markus Krüger (KombiBus), 2 May 2018

¹³ Interview with Markus Krüger (KombiBus), 2 May 2018

text box below). The third and final approach is digital solutions (e.g. e-health), which are increasingly discussed as a viable way to address service gaps in rural communities.

NEW FORMS OF RURAL SERVICE DELIVERY

1. Integrated service delivery, including:

- *Colocation* of several services into one building or space;
- *Collaboration* between service deliverers in terms of information, administration, training, etc.;
- *Cooperation* between professional teams to provide more joined-up services;
- *Co-production* between public, private and community organisations, and particularly, *community-based solutions*.

2. Alternative and more flexible delivery approaches, including:

- *Mobile services* – taking the service to the people;
- *Hub and spoke models* – where the services are provided regularly from a central location, but there are outreach services less regularly or at a lower level in more remote areas;
- *New and improved services adapted to local needs* (quality, marketing, the creation of totally new service approaches).

3. Digital solutions^(*)

(*) The OECD includes digital solutions as one possible alternative delivery approach along with mobile services, but given their horizontal nature and their growing importance for smart villages, they have been separated out here and covered in chapter 4.

Figure 3. New forms of rural service delivery (Source ENRD 2018).

Relevant sociocultural considerations

Knowledge of the service gaps and needs of the residents is an important precondition for developing successful service-to-people solutions. Many of the initiatives that increase access to services in rural areas emerge through a bottom-up approach relying on strong social ties and driven individuals and volunteers within the community.

When it comes to service users, sociocultural considerations will depend on the type of solution offered. Services that visit people in their homes may work well for elderly residents or those who have difficulties leaving their homes. It is important to

acknowledge however that these services may be limited in their ability to offer social interaction. Digital services have a similar limitation, meeting the service need but not necessarily replacing the activity previously associated with accessing the service (e.g. downloading an online book as opposed to visiting the library).

Multi-service hubs may be more effective in meeting social needs as they provide a physical venue where the community can come together. At the same time, the fixed geographical nature of such venues implies that some other form of mobility will be required in order to access the services. As such, this type of solution is perhaps best suited to communities where the population is clustered around a centre of some sort. Where the population is more dispersed, it might be necessary to couple a service centre with another mobility solution (e.g. DRT) in order to ensure access for those in the community who do not have their own transport. Alternatively, mobile solutions that visit different places at different times could be useful in providing central meeting places in different geographical locations on an intermittent basis (ENRD, 2018).

Digital solutions are one possible innovative service-to-people delivery approach. Digital solutions are gaining popularity in Europe as means to provide more targeted and cost-effective home- and healthcare to remote rural populations. When used correctly, such solutions have a potential to improve both the quality of care (e.g. through remote monitoring possibilities and logistical improvements) and social cohesion (see example in a text box) (ENRD, 2018).

Mobile services – taking the service to the people in Latvia

Samaritan Mobile Care in rural areas in Latvia is an initiative run by an NGO. It provides home support services to mainly the elderly people. Samaritan caravan has an autonomous power generator, a shower, a toilet, a washing machine, specialized equipment for foot care and haircutting to drive to a person's place of residence. While the person receives care, the social worker cleans up the house and helps with other tasks, e.g. preparing firewood. The initiative was selected as one of 10 finalists in the European Commission's Social Innovation Competition, out of 1,400 projects from all over Europe (Samaritiesi 2018).

What works and why?

Multi-service hubs provide one means of improving accessibility of services in rural areas with low population density. Co-locating services helps small rural businesses providing services to survive, or even thrive, by helping to reduce economic risk, reduce costs and save resources. Different services can be co-located, such as the groceries store, a post office and some small businesses.

Service Centre in Kalix Övre Bygden in Sweden is one example where co-location has been successful in retaining services within a rural area.

It began when the economic association established by the residents in 1995 took over the management of the local store. Gradually, the service centre expanded its activities to the provision of a home care service and a taxi service for school children. The Service Centre rents out office spaces in the old station house. It also rents its employees to different businesses in the village to perform various maintenance jobs in the field of construction, cleaning, gardening, etc.¹⁴

E-health care in rural Germany.

The AGnES programme in Germany allows general practitioners to use specially trained nurses to make home visits and provide routine medical procedures. Nurses use a tablet-PC to communicate patients' health information to the general practitioner in real time. When necessary, video-conferences are used. In addition, technologies for distance monitoring of blood pressure, weight and additional health parameters are being explored (OECD 2015).

Another example of a multifunctional village centre is a MarktTreff concept that started in Germany in 1999 and is currently established in 39 communities. The local groceries store is the core business that is supplemented by other services (e.g. a second-hand shop, hairdresser, massage studio, cosmetics studio) depending on the needs of the community. The solution relies on some volunteer support (Schmiedek-Inseldmann 2018) (read more: MarktTreff case study).

Village House Service Centres were established in the most remote villages of the municipality of Iloantsi, Finland, to bring various services to the inhabitants in 2014. Different services are available in the service centres on a weekly or monthly basis (based on reservations made by the village inhabitants). The service providers are both small enterprises and municipal officials (e.g. nurses from municipal health-care centres). The services and activities provided include health-care, a hairdresser, foot care, various educational courses, events, small trips and food services. The coordination of centres' activities and the service providers is now the responsibility of the volunteers at the village associations. The space provided at the village houses can be used free of charge, which made it easier to attract private service providers (read more: Village House Service Centres case study).

Common (sociocultural) barriers to success

As noted above, the wide variety of service-to-people approaches make it difficult to identify specific sociocultural barriers to success. Common to all solutions however is the need to match the solution to the specific needs of the community. Thus, engaging community members in the development of

¹⁴ Interview with Eliasson, M. (Service Centre in Övre Bygden) on 16 September 2016.

any solution is vital, as is supporting bottom-up initiatives that come directly from the community themselves.

PART 3: Towards a “road-map” for planning rural mobility solutions (sociocultural lens)

As noted in the introduction, this study is one of three pre-studies that will provide information to support the implementation of the MAMBA pilots. At a later stage in the project there are plans to combine the findings of these pre-studies to develop a “road-map” for planning rural mobility solutions. The aim of this third and final section is to provide a brief snap-shot of the findings of this report to inform this work from a sociocultural perspective. This snap-shot is provided in Table 2.

Table 2. Summary of relevant target groups for different mobility solutions based on sociocultural factor analysis

Solution	Relevant sociocultural considerations			
	Individual-related factors	Context-specific factors	Governance-related factors	Potential target groups
1. Demand responsive transport (DRT)	<ul style="list-style-type: none"> - has a social component - usually includes some form of assistance if required - works best in areas with aging populations 	<ul style="list-style-type: none"> - ideal for isolated communities with dispersed populations - real-time information on services useful for some passengers - online and offline booking options should be provided - taxis may work better in small, dispersed populations and minibuses in larger places with more concentrated populations 	<ul style="list-style-type: none"> - requires subsidies - relies on volunteer drivers - well-suited to a community oriented partnership model - works best when coordinated with other services (e.g. healthcare) - requires concerted marketing and branding efforts 	<ul style="list-style-type: none"> - the elderly (particularly women)
2. Car sharing	<ul style="list-style-type: none"> - offers users a high level of flexibility and autonomy - opportunity to reduce environmental impact without sacrificing independence 	<ul style="list-style-type: none"> - no expectation of social contact with others - relies on a central parking place easily accessible to users - generally relies on an online booking system - works better when trust is established between users (e.g. tight-knit communities, members of same target group) 	<ul style="list-style-type: none"> - works best with peer-to-peer promotion (e.g. "local champions", engaged steering group) - Local government an important stakeholder (even potential to include own fleet in the pool) - requires measures to keep the fleet in a good condition - higher fixed cost (i.e. membership fee) and lower rental fee can increase usage 	<ul style="list-style-type: none"> - occasional car users looking for a cheaper and/or more environmentally friendly alternative to car ownership - two car households looking for a more cost-effective and/or environmentally friendly alternative to a second car

3. <i>Ride sharing</i>	<ul style="list-style-type: none"> - has a strong social component - provides limited flexibility and autonomy - high cost-saving potential - requires a change of habit and thus must offer clear benefits to users (e.g. be more convenient or cheaper than other options) 	<ul style="list-style-type: none"> - requires a high level of trust between strangers - generally relies on an online platform of some kind (a well-known platform like Facebook may be more familiar to users and saves on set-up cost) - relies on people going in the same direction at the same time - works best in villages located within commuting distance of a larger centre (i.e. with many people traveling in the same direction at similar times) 	<ul style="list-style-type: none"> - legal aspects can be challenging (e.g. security measures, drivers licence checks) - works best as a bottom-up initiative - requires marketing, promotion and buy-in from local community as a starting point for behaviour change - Requires a dedicated individual / group to get things started and keep them going - attracting drivers can be a challenge - incorporating taxi companies in the solution can be useful in avoiding conflict 	<ul style="list-style-type: none"> - people with strong environmental motivation and / or less fixed transport habits (e.g. urbanites who have recently moved to a rural area, young people) - work commuters - people with spare time seeking social contact (e.g. retirees) - low-income groups - people participating in hobbies / classes together (e.g. after-school activities for young people)
4. <i>Mobility as a Service (MaaS)</i>	<ul style="list-style-type: none"> - high level of convenience and flexibility - potential for cost savings compared to private-car ownership - time savings - incorporates door-to-door options 	<ul style="list-style-type: none"> - relies on the presence of a variety of transport options - relies on an online platform 	<ul style="list-style-type: none"> - may require public subsidies due to lack of commercial viability in rural areas - may need to bring on board less traditional "public" transport services to make viable in rural areas (e.g. school buses, DRT) - can be expensive to develop a well-functioning MaaS platform (collaboration between municipalities could reduce cost) 	<ul style="list-style-type: none"> - people without cars - two car households looking for a more cost-effective and/or environmentally friendly alternative to a second car - young people

			- requires strong collaboration between government, businesses and citizens to be adapted to the rural context	
5. <i>Combined transport solutions</i>	<ul style="list-style-type: none"> - low level of flexibility and autonomy - potential for cost savings - may offer potential for supported travel (dependant on the solution) 	<ul style="list-style-type: none"> - may rely on centralised pick up points (not ideal for heavily dispersed populations) - may rely on online platforms 	<ul style="list-style-type: none"> - cannot work without strong collaboration in policy (between different policy areas) and in practice (between different service providers and between public and private actors) - requires good knowledge of the transport needs of the target group - should be branded in a way that provides credibility (e.g. municipal initiative) - may involve legal hurdles (e.g. utilising school bus routes for other travellers) - requires an open mind and outside-the-box thinking - raising public awareness and inspiring confidence in new initiatives can be a challenge 	<ul style="list-style-type: none"> - low income earners - people without cars
6. <i>Service to people</i>	- eliminates the need for mobility	- relies on dedicated individuals and strong ties between community members	<ul style="list-style-type: none"> - solutions tend to emerge through a bottom-up approach - requires a high level of collaboration between stakeholders 	- people with limited mobility

References

- Aapaoja A, Eckhardt J and Nykänen L (2017) MaaS in rural areas - case Finland. ICoMaaS, Tampere 28.-29.11.2017 Conference Proceedings 1st International Conference of Mobility as a Service.
- Ahern A and Hine J (2015) Accessibility of Health Services for Aged People in Rural Ireland. *International Journal of Sustainable Transportation* 9(5): 389–395. DOI: 10.1080/15568318.2013.800926.
- Ahern DA, Hine PJ and Begley DE (2010) Rural transport – going nowhere fast. UCD School of Architecture, Landscape and Civil Engineering.
- Berg, J. (2016). Everyday mobility and travel activities during the first years of retirement. (Doctoral dissertation). Norrköping: Linköping University, Department of Social and Welfare Studies, NISAL
- Berg J and Thoresson K (2017) *Mobilitet och transportlösningar på landsbygd - En internationell litteraturstudie*. VTI (Swedish National Road and Transport Research Institute). Available at: https://www.vti.se/sv/Publikationer/Publikation/mobilitet-och-transportlosningar-pa-landsbygd_1133341 (accessed 20 June 2018).
- Bergstad, C. J., Gamble, A., Hagman, O., Polk, M., Gärling, T., & Olsson, L. E. (2011). Affective–symbolic and instrumental–independence psychological motives mediating effects of socio-demographic variables on daily car use. *Journal of Transport Geography*, 19(1), 33–38.
- Burkhardt, J. & Ball, A. (2006). Who is Attracted to Carsharing? *Transportation Research Record Vol 1986*, Issue 1, pp. 98 – 105.
- Brake J and Nelson JD (2007) A case study of flexible solutions to transport demand in a deregulated environment. *Journal of Transport Geography* 15(4): 262–273.
- Carme Miralles-Guasch, Montserrat Martínez Melo & Oriol Marquet (2016) A gender analysis of everyday mobility in urban and rural territories: from challenges to sustainability, *Gender, Place & Culture*, 23:3, 398–417, DOI: 10.1080/0966369X.2015.1013448
- Carrus, G., Passafaro, P. and Bonnes, M. (2008) Emotions, habits and rational choices in ecological behaviours: the case of recycling and use of public transportation. *Journal of Environmental Psychology* 28: 51–62.
- Codatu (2016) <http://www.codatu.org/wp-content/uploads/Ela-Babalik-Sutcliffe-HABITAT-Wks-Paris-13-Apr-16.pdf>
- Copus A, Perjo L, Berlina A, et al. (2016) *Social innovation in local development: Lessons from the Nordic countries and Scotland*. Stockholm: Nordregio. Available at: [https://www.dropbox.com/preview/ESPON%20BRIDGES%20External/4.%20References%20\(folder%20for%20file%20transfers\)/FULLTEXT01.pdf?role=personal](https://www.dropbox.com/preview/ESPON%20BRIDGES%20External/4.%20References%20(folder%20for%20file%20transfers)/FULLTEXT01.pdf?role=personal).

- Davison L, Enoch M, Ryley T, et al. (2012) Identifying potential market niches for Demand Responsive Transport. *Research in Transportation Business & Management* 3. Flexible Transport Services: 50–61. DOI: 10.1016/j.rtbm.2012.04.007.
- Deloitte (2017) *Car sharing in Europe. Business Models, National Variations and Upcoming Disruptions*.
- ENRD (2017) Smart Villages. Available at: https://enrd.ec.europa.eu/smart-and-competitive-rural-areas/smart-villages_en (accessed 4 July 2018).
- ENRD (2018) *Smart Villages. Revitalising rural services*. 26, EU Rural Review.
- European Commission (2007) Transport on demand in rural Scotland-Projects. Available at: http://ec.europa.eu/regional_policy/en/projects/united-kingdom/transport-on-demand-in-rural-scotland (accessed 21 June 2018).
- Gray, D., Farrington, J., Shaw, J., Martin, S. & Roberts, D. (2001). Car dependence in rural Scotland: transport policy, devolution and the impact of the fuel duty escalator. *Journal of Rural Studies* 17, 113-125
- Haustein, S., & Nielsen, T. A. S. (2016). European mobility cultures: A survey-based cluster analysis across 28 European countries. *Journal of Transport Geography*, 54, 173-180.
- Haustein, S., & Siren, A. (2015). Older people's mobility: Segments, factors, trends. *Transport Reviews*, 35(4), 466-487.
- Haustein, S. (2012). Mobility behavior of the elderly: an attitude-based segmentation approach for a heterogeneous target group. *Transportation*, 39(6), 1079-1103.
- Jeekel, H. (2014). Social exclusion, vulnerable groups and driving forces: Towards a social research based policy on car mobility. *Case studies on transport policy*, 2(2), 96-106.
- Karlsson M, Koglin T, Kronsell A, et al. (2017) Understanding institutional enablers and barriers to the dissemination of MaaS: A tentative framework.: 5.
- Laws R (2009) *Evaluating publicly-funded DRT schemes in England and Wales*. PhD thesis. Loughborough University. Available at: <https://dspace.lboro.ac.uk/dspace-jspui/handle/2134/17823> (accessed 20 June 2018).
- Li Y and Voege T (2017) Mobility as a Service (MaaS): Challenges of Implementation and Policy Required. *Journal of Transportation Technologies* 07: 95. DOI: 10.4236/jtts.2017.72007.
- Mageean J and Nelson JD (2003) The evaluation of demand responsive transport services in Europe. *Journal of Transport Geography* 11(4): 255–270. DOI: 10.1016/S0966-6923(03)00026-7.
- Mattioli G, Anable J and Vrotsou K (2016) Car dependent practices: Findings from a sequence pattern mining study of UK time use data. *Transportation Research Part A: Policy and Practice* 89: 56–72. DOI: 10.1016/j.tra.2016.04.010.

- Matte, C. (2015). Rural car share options in the Kootenays. Published online on April 30, 2015. <https://crcresearch.org/community-research-connections/crc-case-studies/rural-car-share-operations-kootenays>
- Matthijs, J. (2017). Translating Shared Mobility for Rural Areas: the Rosetta Stone for Car-Sharing in Small Towns, WOCOMOCO 2017, Berlin.
- Matthijs, J. (2018). "Big Solutions for Small Places: Promoting Shared Mobility Innovations in Rural Areas " Share-North Webinar, 20 April 2018.
- Mc Kenna, M. (2017). Flexibus Local Link Louth Meath Fingal – what keeps our wheels rolling. Presentation at the European Rural Parliament, Netherlands, 2017.
- Nelson JD and Phonphitakchai T (2012) An evaluation of the user characteristics of an open access DRT service. *Research in Transportation Economics* 34(1). Gender and transport: Transaction costs, competing claims and transport policy gaps: 54–65. DOI: 10.1016/j.retrec.2011.12.008.
- OECD (2009) *Improving Local Transport and Accessibility in Rural Areas through Partnerships*.
- OECD (2010) OECD Rural Policy Reviews: Strategies to Improve Rural Service Delivery. Available at: <http://www.oecd.org/cfe/regional-policy/oecd-rural-policy-reviews-strategies-to-improve-rural-service-delivery.htm> (accessed 4 July 2018).
- OECD (2016) *Intermodal Connectivity for Destinations*.
- Parker, C., Walker, C. & Johnson, R. (2011). What can we learn from car sharing experiences in the UK? *Proceedings of the Institution of Civil Engineers - Transport* 164 (3), 181-188.
- Prettenthaler, F. & Steininger, K (1999). From ownership to service use lifestyle: the potential of car sharing, *Ecological Economics*, 28, (3), 443-453.
- Pöllänen M, Utriainen, R. and Viri, R. (2017) Challenges in the Paradigm Change from Mobility as a Self-service to Mobility as a Service.: 34.
- Regional Council of North Karelia (2010) *Rural Transport Solutions in Northern Periphery. Existing transport services in RTS partner regions. Structure, modes, challenges and best practices*.
- Reichenberger A, Rubini L, Mazzarino M, et al. (2018) *EU-wide status quo analysis*. Deliverable in Interreg Central Europe Project -Peripheral Access.
- Schaefer, T. (2013). Exploring carsharing usage motives: A hierarchical means-end chain analysis, *Transportation Research Part A: Policy and Practice*, 47, issue C, p. 69-77.
- Schmiedek-Inselmann, A. (2018) Interview with "Markttreff", May 2018

- Shaheen, S., Cohen, A. & Chung, M. (2009). North American carsharing: 10-year retrospective. *Transportation Research Record* 2110, 35–44.
- Share North (2017) Translating Shared Mobility for Rural Areas: the Rosetta Stone for Car-Sharing in Small Towns – Share North. Available at: <https://share-north.eu/2017/10/translating-shared-mobility-for-rural-areas-the-rosetta-stone-for-car-sharing-in-small-towns/> (accessed 29 June 2018).
- Steger-Vonmetz, C. & Steinwender, K. (2009). Austria: tailor made approaches based on the implementation of Caruso boxes and platform management for third party cars in small e-fleets, E-Bridges project, July 2014.
- Wang C, Quddus M, Enoch M, et al. (2015) Exploring the propensity to travel by demand responsive transport in the rural area of Lincolnshire in England. *Case Studies on Transport Policy* 3(2): 129–136. DOI: 10.1016/j.cstp.2014.12.006.
- Walks, A. (2016) Assessing and Measuring the Factors Affecting Mobility, Transportation Accessibility, and Social Need: Barriers to Travel among those with Low Income and Other Vulnerable Groups. Available at: http://www.metrolinx.com/en/regionalplanning/rtp/research/Assessing_and_Measuring_the_Factors_Affecting_Mobility_Transportation_Accessibility_and_Social_Need.pdf (accessed 4 July 2018).

Interviews

- Arby, Hans, CEO of UbiGo, interview on 17 May 2018.
- Eliasson, Mikael, operations manager at Service Centre in Övre Bygden, interview on 16 September 2016.
- Krüger, Markus, LaLoG LandLogistik GmbH (KombiBus), interview on 2 May 2018.
- Klaassen, Pepijn 'Peppe', one of the owners of Mobilsamåkning, telephone interview, 22 January 2018
- Liimatta, Eija, Village House Service Centres, interview on 7 May 2018.
- Sørensen, Nicolai B, the Transport Authority of Northern Denmark (Nordjyllands Trafikselskab), interview, 28 February 2018
- Ylipiessa, H., the Executive Manager of Ylläs Travel Association, interview, 4 May 2018.