

# Linking experienced barriers during daily travel to transport poverty in peripheral rural areas: the case of Zeeland, the Netherlands

Felix Johan Pot<sup>1,\*</sup>, Taede Tillema<sup>1,2</sup>, Sierdjan Koster<sup>1</sup>, and Peter Jorritsma<sup>2</sup>

<sup>1</sup>Department of Economic Geography, Faculty of Spatial Sciences, University of Groningen, PO Box 800, 9700 AV Groningen, the Netherlands

<sup>2</sup>KiM Netherlands Institute for Transport Policy Analysis, Ministry of Infrastructure and Water Management, PO Box 20901, 2500 EX, The Hague, the Netherlands

\*Corresponding author: f.j.pot@rug.nl

## ABSTRACT

Those living in peripheral rural areas are often considered to be prone to transport poverty and inaccessibility to activities. Previous identifications of transport poverty have been based on instrumental measures of potential accessibility including observable factors related to the transport system, socio-demographics, and land use characteristics. By conducting semi-structured focus group discussions with commuters, school-going adolescents and seniors in Zeeland, the Netherlands, it has been shown that the mechanisms behind transport poverty are also driven by individual subjective perceptions of accessibility while potential accessibility might only set the scene for potential activity participation. These perceptions seem to be shaped by local social norms embedded in the local context. In peripheral rural areas, social norms related to the dominance of the car seem to add to the negative appropriation of other transport options and collective feelings of 'left-behind' and 'locked out', which seem to contribute to the feeling of exclusion. Therefore, it can be argued that considering subjective appropriations regarding the transport system and individual abilities, which are at least partly shaped by the local geographical context, will add to the understanding of the nature of accessibility problems in that region and will be valuable in designing responsive policies.

*Keywords:* transport poverty, accessibility, rural transportation, population decline, qualitative methods

## 1 Introduction

Many peripheral rural regions across Europe are confronted with declining services and populations as a result of centralisation and urbanisation forces (Martinez-Fernandez et al., 2012). This entails a need to cover larger distances to engage in activities and to reach services for inhabitants of these areas. Especially in rural areas, those with less potential to be mobile may be constrained in participating in the economic and social life of the community due to reduced accessibility to opportunities, services and social networks (Currie, 2010). This situation is often referred to as 'transport poverty' which may eventually result in a process of social exclusion (Lucas, 2012). For the Netherlands, it has been predicted that one in five municipalities will experience population decline by 2030 (PBL, 2019). Mobility in terms of yearly kilometres travelled per inhabitant has already risen between 2005-2015 in peripheral rural regions facing population decline (Tillema et al., 2019). This was mainly due to increasing travel distances and contrasts the pattern found in growing urban concentrations. The question arises how these spatial transformations potentially impact experiences of transport poverty in these regions.

Little is known about the scale, the mechanisms behind and potential social impacts of transport poverty in peripheral rural areas in the Netherlands (Jorritsma et al., 2018), while the Netherlands, however, pose an interesting context.

In many cases, regions that are considered to be rural in the Dutch context actually exceed OECD population density thresholds (Haartsen et al., 2003). Additionally, Dutch rural regions have very dense road networks and close links to urban centres. Still, some Dutch peripheral regions, including Sealandic Flanders and Schouwen-Duiveland in the province of Zeeland, which have been selected as case study areas for this paper, show similar to other peripheral rural regions in Europa development patterns of decline, albeit on a lower scale. With respect to transportation, public transport services have marginalised as a result of low demand, while proposed (smart) mobility solutions such as demand responsive transport services face many financial and organisational difficulties (e.g. Wang et al., 2015).

Accessibility levels in Dutch peripheral areas may be considerably higher than in other more sparsely populated and sprawled contexts in which accessibility issues have been analysed (e.g. the UK: Ahern Hine, 2012), which potentially decreases the risk of inhabitants experiencing transport poverty. However, transport poverty and the related participation in activities are often regarded as relative with respect to what are 'normal' levels of participation and travel behaviour in the local community (Kenyon et al., 2002). The identification of transport poverty by means of thresholds for potential accessibility based on, for example, maximum allowable travel times (e.g. Statistics Netherlands, 2018; Jonkers et al., 2019) can therefore be considered as a highly normative practice (Farrington Farrington, 2005) lacking the link with actual experienced accessibility. Beyond instrumental factors, an individual's own evaluation of mobility options is crucial in the potential to reach activities at distance (Kaufmann et al., 2004). This appropriation may be based on, for example, (a combination of) previous travel experiences (Shliselberg Givoni, 2018); attitudes towards modes, mediated by local social norms (Steg, 2005); and desires with respect to what activities should be within reach (Farrington Farrington, 2005). This paper aims to unravel these mechanisms by establishing how inhabitants of peripheral rural areas evaluate their daily accessibility barriers to services and activities. As transport poverty and the associated exclusion are conceptually seen as geographically relative and normative concepts with respect to local norms and habits related to travel (Kenyon et al., 2002), an understanding of the mechanisms behind the formation of subjective perceptions, and especially the role of the local geographical context, on accessibility may well be crucial in the evaluation of these concepts. The contribution of this paper, therefore, is a deeper understanding on the role of subjective evaluations, which may be embedded in the local geographical context, regarding the transport system and one's individual competences to use this system in the mechanisms behind the experience of transport poverty.

The evaluation of experienced barriers during daily travel is done by conducting semi-structured focus group interviews with in total 21 participants living in Sealandic Flanders and Schouwen-Duiveland in the Dutch province of Zeeland divided among groups of commuters, seniors and school-going adolescents. Regarding the groups studied, commuters have been chosen as employment imposes a very dominant time-space constraint for the participation in non-discretionary activities (Farber Páez, 2011). A similar constraint holds for school-going adolescents, with the addition of inevitable transport disadvantages such as not being able to drive a car. Seniors may desire very different activity patterns and are commonly regarded as a group vulnerable to transport poverty due to decreasing mobility competences (Lucas, 2004).

The next section will elaborate more on transport poverty in rural areas and the role of subjective insights in analysing accessibility problems with respect to this geographical context. In section 3, the case study and methodological approach are elaborated upon. Section 4 presents the study results which are followed by a discussion in section 5 and some conclusions and directions for further research in section 6.

## **2 Theoretical framework**

### **2.1 Transport poverty in rural areas**

Given that most activities humans engage in are dispersed across space, the possibility to access these activities through transportation is increasingly seen as a key factor for the inclusion in society and well-being (Currie

Delbosc, 2010; Lyons, 2003; Preston Rajé 2007; Social Exclusion Unit, 2003; Stanley et al., 2011). The concept of geographical accessibility may be at the heart of the analysis of the (im)possibility to engage in activities at distance. Following Geurs and Van Wee (2004), accessibility can be defined as *'the extent to which land-use and transport systems enable [...] individuals to reach activities or destinations by means of a (combination of) transport mode(s)'* (p. 128). In this sense, factors that lie within the individual as well as geographical factors relating to the spatial dispersion of destinations and the transport system determine the possibility to participate in desired activities. Lucas (2012) posits that those that are transport disadvantaged (e.g. no access to car, poor public transport provision) combined with social disadvantages (e.g. low income, low skills, ill-health, low social capital) can be considered as transport poor. Being transport poor may impose lower participation in higher education, lower access to health services, higher rates of unemployment and less involvement in social networks, which may result in a process of social exclusion (Kenyon, 2011; Lucas, 2012, Mackett Thoreau, 2015; Preston Rajé, 2007; Stanley et al., 2011). Studies identifying groups most likely to be at risk of transport-related social exclusion often list seniors, youth, the impaired, ethnic minorities, those on low incomes and those with little or no access to cars (Delbosc Currie, 2011).

Rural areas are often considered to be particularly prone to transport poverty due to low densities, ageing population structures and the decline of local services (Scott Horner, 2008). While facility-decline in these areas predominantly occurs due to the absence of agglomeration benefits and competition with near urban areas which are now also reachable for many rural residents (Bosworth Venhorst, 2018), population decline may add to the pressure on local facilities and public services in peripheral rural areas (Van Dam et al., 2006). As a result of the dispersion of activities mobility has become an essential part of everyday rural life (Milbourne Kitchen, 2014). Lower densities and longer distances have, therefore, resulted in a high reliance on private car usage in rural areas, offering the flexibility needed and expected in modern societies (Gray et al., 2001; Urry, 2004). Since most rural households counteract the consequences of facility-decline by enhancing automobility (Steenbekkers Vermeij, 2013), public transport has marginalised in many rural areas due to rising operating costs and budget cuts (Veeneman et al., 2015).

Rising car dependence in rural areas may have significant impact on the structuring of daily travel and activity participation. As Farber and Páez (2011) show from a time geography perspective both theoretically and empirically, accessibility benefits gained from access to a car may be negated by the dispersion of activities enabled by auto-oriented development. Here, one may speak of specific geographical disadvantages in terms of distances that are at play in the formation of transport poverty, in addition to and interacting with transport and social disadvantages coined by Lucas (2012). In the UK, Smith et al. (2012) argued that low income households in rural areas are highly dependent on cars to access services and are not only affected by rising fuel costs, as well as by the overall cost of running a car. This is confirmed by Dargay (2002), who has found that rural households' car ownership levels are far less sensitive to motoring costs than that of their urban counterparts. Kamruzzaman Hine (2012) found that non-car owning and low-income individuals were more limited to participating in activities within their local area than their car owning and high-income counterparts. Especially risks for older people in rural areas have been well documented. Results from Spain show that the rural elderly use health services almost three times less frequently than their urban counterparts because of transport problems (Fernández-Mayoralas et al., 2000).

## **2.2 The role of subjective experiences in identifying transport poverty**

While the spatial distribution of activities and the availability of transport are central elements in an individual's accessibility, these only represent the potential for reaching services and activities. An individual's actual experienced accessibility will be lower. Kaufmann et al. (2004), stress that this maximum opportunity set is constrained by one's appropriation of the possibility of movement (motility). This appropriation refers to perceived access and is based on, for example, an individual's values, norms, expectations, opinions and habits. For example, Van Exel Rietveld (2009) found that car users systematically overestimate public transport travel times. This way, even when an individual is capable of using a certain transport mode, this option may not be valued as such based on one's subjective appropriation. While perceptions may be inaccurate representations of reality, numerous studies have found that perceptions of accessibility show more behavioural realism than objective measures (e.g. Kitamura et al.,

1997; Lättman et al., 2018; Scheepers et al., 2016).

Strong links can be drawn here with psychological analyses of travel behavior. Following Ajzen (1991), the intentions to perform certain behaviour depend on three factors: (i) attitudes, referring to personal opinions and beliefs on the outcomes of behavior; (ii) subjective norms, referring to opinions and beliefs on the outcomes of behavior of others; and (iii) perceived behavioural control, reflecting the extent to which one thinks one is capable of engaging in the relevant behavior. Someone may have positive attitudes towards the use of public transport, but may consider himself or herself unable to make use of it, due to a lack of perceived physical and/or organisational skills, or unawareness of its availability. Elderly, for example, have in some cases been found to have limited perceived competences with respect to accessing public transport (Shergold Parkhurst, 2012). Also, people generally have favourable attitudes towards car use compared to public transport, not only through instrumental motives (such as flexibility and time), but also through affective (such as comfort and feelings of safety) and symbolic motives (such as senses of freedom and self-control) (Steg, 2005). In this sense, perceived limitations on the potential to travel may generate lower feelings of competence and self-reliance (Nordbakke, 2013), adding to one's perceived constraints on mobility.

As attitudes and feelings of control with regards to transport are also influenced by social norms, the local geographical context may play an important role in the subjective evaluation of accessibility. Differing norms with regards to transport between geographical contexts have for example been coined by Mikalis Van Wee (2018), reporting different acceptable commuting times in the US and Europe. In rural areas, the car may be, more than in urban regions, a reference point, while other forms of mobility may be burdened with social stigmas (see Ahern Hine, 2012; Shergold Parkhurst, 2012). When using the car is the norm, other transport options (when available) may be less considered as a viable option. In rural areas, community transport solutions have been found to carry a social stigma, being only for women and the 'less able' (Ahern Hine, 2012; Shergold Parkhurst, 2012). Relying on social networks to meet transport needs has been found to be characterised by reluctance and undermining feelings of self-reliance due to a creation of dependent relationships in which the individual feels indebted to the lift-giver, resulting in skipping non-essential trips (Ahern Hine, 2012). These factors may strengthen local norms and habits regarding travel and therewith the risk of transport poverty for the less mobile. This process has been identified in rural areas of the UK earlier where the non-car population, despite its lower potential mobility, has adopted the same values and aspirations as its car-owning neighbours (Nutley, 2005).

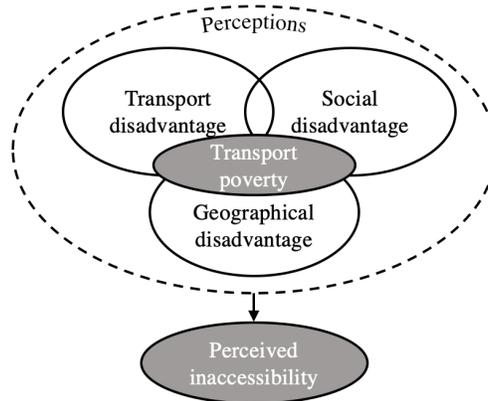
While personal attitudes towards travel and accessibility may add to the constraints regarding reaching activities, subjective evaluations may also have a mitigating role in the mechanism behind transport poverty. Long term limited access to transport can result in lower expectations on accessibility, as individuals tune their desires to their environment (Delbosc Currie, 2011; Lucas, 2004, 2006). Desired accessibility would then become lower in rural areas (Farrington Farrington 2005).

### **2.3 Analytical framework**

Building on the theoretical discussion presented above, an analytical framework has been developed to analyse the mechanism behind transport poverty in peripheral rural areas (see figure 1). The model builds on Lucas' (2012) framework of transport poverty transport-related social exclusion, in which transport disadvantages and social disadvantages (personal competences) combined lead to transport poverty. However, a geographical component has been extricated to emphasise the possible role of distance in the experience of transport poverty, which may be especially important in rural areas. It may, following arguments from time-geography, be that households with access to cars are still limited in their accessibility due to large distances to activities (Farber Páez, 2011). These large distances can impose constraints in terms of available time to engage in multiple activities. These constraints might especially come to the fore in peripheral rural areas, which have therefore been selected as study areas, where distances are or perceived to be larger than in urban areas.

Furthermore, a layer concerning perceptions on the domains determining transport poverty has been added to explicitly allow for a role of subjective experiences. Perceptions regarding the transport component are based on

the importance of appropriation of travel options coined by Kaufmann et al. (2004), which may be formed by personal attitudes and social norms. These may therefore include subjective evaluations of available transport modes. Perceptions regarding the social component include one's appropriation of one's own skills and possibilities, such as physical and organisational skills. Perceptions on the geography are linked to the experience of distances and one's travel horizons as well as local social norms influencing one's evaluation towards accessibility. In this sense, how the transport system, personal competences and the geographical context interact and are evaluated, influences the perception of what is within reach.



**Figure 1.** Analytical model to illustrate the relationship between perceptions of disadvantages related to mobility and transport poverty.

### 3 Methods

#### 3.1 Case study area

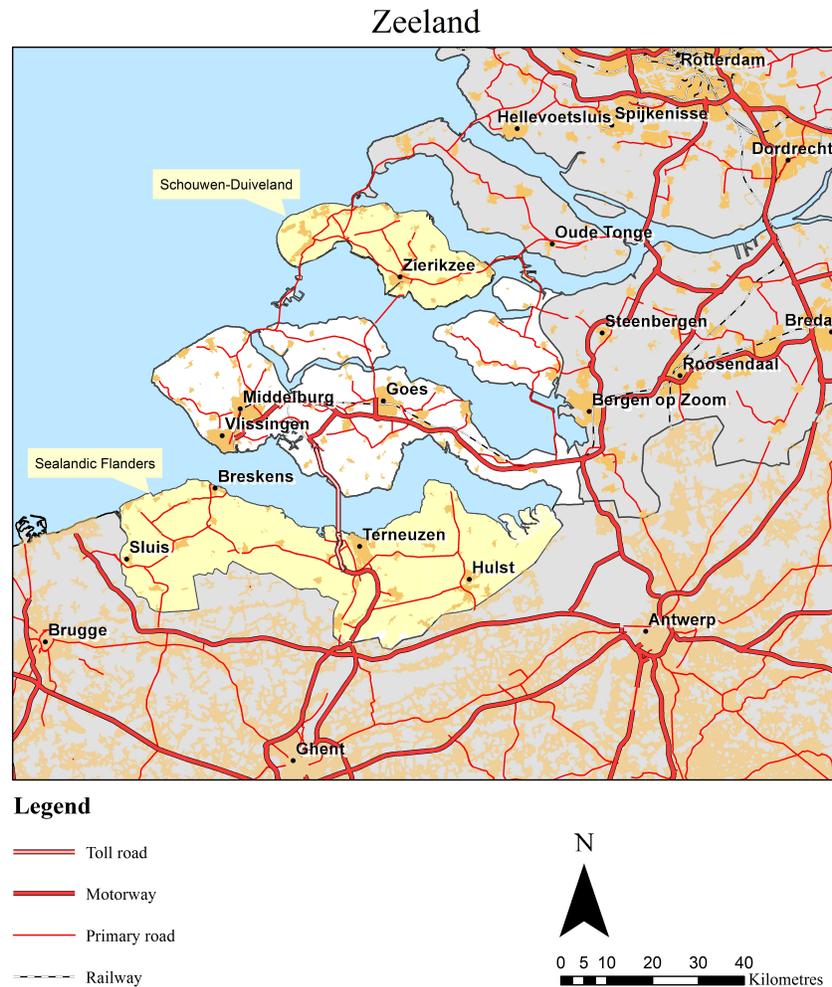
The areas of Sealandic Flanders and Schouwen-Duiveland in the Dutch province of Zeeland have been selected as study areas (see figure 2). Zeeland is one of the most sparsely populated provinces in The Netherlands with a population density of 215 inhabitants per square kilometre (Statistics Netherlands, 2019). While many municipalities exceed the OECD-standards to be regarded 'rural', the study areas are commonly regarded as rural and peripheral (Haartsen et al., 2003). The region is confronted with major population and services decline (Haartsen Venhorst, 2010). It is projected for the areas of Schouwen-Duiveland and Sealandic Flanders the population will fall over 10% in the coming decades.

A rather centralised structure of services can be identified in the province of Zeeland, which is common for peripheral rural areas. Services and employment are centered in the main cities and villages. Additionally, the peninsular structure of the province impose barriers to travel between regions resulting in very localised functional structures with over 50% of the employed inhabitants in the study areas live and work within the same municipality (Statistics Netherlands, 2017).

The main road network of the study areas is quite dense as all major population clusters are connected with each other and near population centres outside the province by primary roads or motorways. A toll tunnel as well as a ferry connect Sealandic Flanders with the central peninsula of Zeeland, Walcheren and Zuid-Beveland. The main public transport network predominantly follows the same structure either through a single train link and multiple regular serviced bus lines both on weekdays and weekends from 6AM to 10PM. Gaps in the main network are filled by a secondary network. A so-called 'buurtbus' system (local bus), which is only available during weekdays, is scheduled connecting smaller villages by small busses (max. 8 persons). Also, there is a bus system for (high school) students, which is a bus service only available during peak-hours and only for high school students. Additionally, there is a cab service available for former-existent bus stops. It runs on a regular schedule but only shows up when

it has been called up at least one and a half hour in advance. This ‘stop taxi’ service also replaces the regular bus services during weekends.

In short, the study areas are regarded as rural peripheral areas and show common patterns of services and population decline combined with centralisation. Regular public transport services follow the same centralised structure, while the network connecting smaller towns has been marginalised. Additionally, the peninsular structure of Zeeland adds a natural geographical barrier through physical barriers to travel between regions, which may add to the risk of transport poverty.



**Figure 2.** Study areas and their topographical context.

### 3.2 Focus group discussions

Semi-structured focus group interviews have been conducted to collect subjective perspectives on daily travel experiences. Focus groups provide the opportunity for interaction between respondents. Behavioural attitudes, motivations and intentions (related to travel behaviour) may also be shaped by local social norms. These interactions would not be represented in in-depth interviews. However, one disadvantage of focus groups compared with individual interviews could be the reluctance of participants to elaborate on experiences of social exclusion as a

result of transportation problems as this might be too sensitive to discuss within a group. As the main interest of this paper is to understand the mechanisms behind transport poverty in peripheral rural areas rather than the consequences in terms of exclusion, group discussions are the preferred method.

Separate sessions have been held consisting of daily commuters, seniors and high school students. Respondents have been recruited from the database from Dutch survey agency TNS NIPO in corporation with the marketing research agency KANTAR Public, via social media outlets from the province of Zeeland and by approaching an intermediate vocational education institute in the city of Goes, Zeeland. A description of the composition of the focus groups can be found in table 1. Most participants reside in Sealandic Flanders, in line with the actual population figures of both study areas. It can be argued that individuals believed to be at risk of transport poverty are well represented in the sample. Most participants were female, except for the focus group with students. Only 8 (38%) participants use the car as their primary mode, while a same share, use public transport as their primary mode of transport. Car-use in the focus group consisting of seniors was higher than within the commuter group. In total, 20%, of which 75% being of senior age, of the participants had some form of physical impairment.

All sessions were held in a small conference room in a hotel in Goes and lasted about two and a half hours. Participants could choose to be travelled to the site by taxi or to receive a reimbursement of their travel expenses when they would travel on their own to the site. Questions posed during the sessions included daily travel needs and patterns, experienced barriers in reaching their desired services and activities, their experience of transport poverty and what they view as causes for arising accessibility problems in the region.

**Table 1.** Focus groups compositions

	Commuters	Seniors	Adolescents	<b>Total</b>
Number of participants	7	8	6	<b>21</b>
Age structure	19-64	65+	12-18	-
<i>Area</i>				
Scouwen-Duiveland	1 (14%)	3 (38%)	3 (50%)	<b>7 (33%)</b>
Zeeuws-Vlaanderen	6 (86%)	5 (63%)	3 (50%)	<b>14 (67%)</b>
<i>Gender</i>				
Male	2 (29%)	4 (50%)	2 (33%)	<b>8 (38%)</b>
Female	5 (71%)	4 (50%)	4 (67%)	<b>13 (62%)</b>
<i>Primary mode of transport</i>				
Car	2 (29%)	6 (75%)	-	<b>8 (38%)</b>
Public Transport	3 (43%)	2 (25%)	3 (50%)	<b>8 (38%)</b>
Bicycle	2 (29%)	-	3 (50%)	<b>5 (24%)</b>
<i>Impairments</i>				
Wheelchair	1 (14%)	1 (13%)	-	<b>2 (10%)</b>
Visual impairment	-	2 (25%)	-	<b>2 (10%)</b>

*Note:* percents may not add up to 100% due to rounding.

## 4 Results

Below, the main findings of our analysis regarding the mechanisms behind transport poverty are presented. The main themes brought forward in the group discussions included: the availability and quality regarding the transport system; social determinants relating to (perceptions of) individual competences and social networks; and geography relating to time-space constraints and local social norms. The findings are structured following the analytical model

proposed in section 2.3. The transport component has been broken down into perceptions on the availability of transport and subsequently, given this availability, the quality of the transport system. The social component, which relates to the individual, are broken down in a section on perceived individual competences followed by a paragraph how social networks play a role in mitigating difficulties in accessing activities. Finally the geographical component is broken down in a section on the land-use structure imposing travel barriers and a section on how local social norms play a role in shaping perceptions of accessibility.

## **4.1 Transport**

### **4.1.1 Availability**

The availability of transport relates mainly to the supply side of mobility. Factors at play are the availability of a car and the nature of the public transport system. Participants with access to cars reported little barriers with accessing transportation at times they wanted to. Only when travelling from Sealandic Flanders to the central parts of Zeeland, the only routes available, a ferry and a toll tunnel, impose additional costs. These costs can, for some, be a major barrier in accessing activities in the main population centres of the province:

*'We never go to [the central parts of] Zeeland actually, it's just way too expensive.'* (Adolescents)

With respect to public transport infrastructure provision, plenty of public transport stops were perceived to be at walkable and cyclable distances. During daytime, reaching employment and school was reported to be doable, especially when travelling between the main villages and cities. Especially since bus schedules are tailored according to regular school schedules. These positive evaluations, however, change when more discretionary activities conducted in evenings and weekends are considered. Public transport availability is more limited during evenings and weekends and no public transport is available after 10 PM. These conditions make it hardly possible to participate in activities by public transport at places that participants could not cycle or walk to:

*'I would love to join a dancing school in Goes, however there is no possibility for me to get back by public transport [in the evenings].'* (Seniors)

Related to the public transport network, participants perceived that there are constantly changes in routes and time schedules. Communication from the transport providers is perceived to be lacking. This may result in a very differentiated picture with respect to perceptions of what transport options are available, a point returned to in section 4.2.1. Frequent changes in schedules without proper communication are especially problematic for the elderly. Seniors undertake more discretionary non-routine trips to varying destinations, which requires thorough planning. The lack of information on the changing availability of public transport services was perceived as a problem and can change one's perception on the availability of transport options:

*'When I arrive at the bus stop I suddenly see a plastic bag hanging on the bus stop sign. Now I know that there won't be a bus anymore, but then there's no sign of where I can get on that bus now.'* (Commuters)

### **4.1.2 Quality**

Next to the availability of transport options, the personal evaluation of the quality of the system also contributes to the perceptions of the ease by which activities can be reached at a distance (i.e. accessibility). The main elements of quality are comfort and ease of use (both in terms of planning as well as during the trip). These are mainly reflected in (on-ride) travel experiences, which were elaborated heavily upon in all discussions. The quality of public transport was frequently set off against the use of the private car. Two components of quality frequently brought forward were travel times and ease of travel. All groups mentioned higher journey complexities combined with longer travel times for public transport compared to the car:

*'When I would have to travel from Noordgouwe to Brouwersdam by bus, I already need to make a change-over, which is quite a hassle. By car it is only 20 minutes.'* (Seniors)

Experiences during waiting times at stations add to the evaluation of the public transport system. Next to physical characteristics of these infrastructures, contextual factors such as weather conditions and perceptions of safety determine these experiences:

*'When you've just missed your buss and you'll have to wait for an hour on an iron bench in the cold.. That's just the worst.'* (Seniors) *'My mom doesn't like it when I go by bus or bike at night. So she picks me up by car.'* (Adolescents)

Also, delays were reported to be common and especially the ways public transport suppliers handle these delays. This is problematic when change-overs need to be made. All groups reported a lack of adaptivity in the system when (small) delays occur:

*'When you arrive at the bus station [on a delayed bus], you see the bus that you have to take is already there. Then you see the doors closing and you know that you have to wait half an hour. If they would just coordinate that, it would help a lot.'* (Seniors)

This lack of adaptivity and flexibility was also reported when problems encountered when directly communicating with the public transport suppliers came to the fore. Customer service was reported to be unfriendly in many cases. This adds to the negative experience, and eventually appropriation of public transport, during travel when disruptions occur:

*'When I called customer service [when a schedule disruption occurred] they said it's just bad luck and you just have to wait for an hour. You feel like... I'm a customer of yours and make your salary possible and then you get an answer like that. I'd like to say that I'm going to another company, but you can't.'* (Commuters)

Also in-ride service quality such as the degree friendliness of the bus drivers were mentioned frequently by all groups. Therefore, it seems that these moments of personal contact are important in the evaluation of the entire public transport system. Additionally, driving behaviour and the related comfort of travel were mentioned sometimes, with bus drivers often characterised as being 'rushed':

*'They get tunnel vision to run the service as fast as possible in order to stick to the schedule and they forget they still have people on the bus.'* (Commuters)

## **4.2 Social**

### **4.2.1 Individual competences**

Experienced difficulties with the transport system can be enforced or strengthened by limited individual competences. Public transport availability was evaluated more negatively by those with physical limitations. Those that are visually impaired reported that they sometimes see the bus coming too late, and thus it does not stop to pick them up. With respect to wheelchair accessibility, only the large busses on the main network have some spots available. The risk of not always being able to enter the bus with a wheelchair makes the system impossible to rely on for those users:

*'Sometimes I can't enter the bus with my wheelchair. Then I have to wait for another hour.'* (Seniors)

Some linkages with the quality component of transport provision can be drawn here. Some individuals with limited physical competences may need more assistance therefore being extra vulnerable when service quality is lacking in public transport. Negative experiences in this domain can impact evaluations of quality to a greater extent when combined with higher demands regarding service:

*'I have had a lot of bad experiences with bus drivers when I travel in my wheelchair. They sometimes don't want to let me on the bus [because of the hassle]. [...] Those kind of things have to do with the fact that they have to drive on time and don't have time [to assist me].'* (Commuters)

Planning a trip by public transport can be a complex undertaking, especially for those with limited digital skills as virtually all information on public transport services is presented online. On top of that, all groups reported that use of public transport system become more complex with the marginalisation of the system. Now, multiple systems (e.g. regular busses and local busses) with multiple ticketing and planning conventions have to be combined to compose a single trip, rather than using just one system (e.g. only the regular bus). A lack of digital skills, especially found among seniors, and consequently sufficient information on the system may lead to individuals not consider a transport option as appropriate:

*'These people [,who do not know how the internet works,] did not ask to be old, and we make life harder for them to promote the use of internet. When you buy a paper ticket, you pay 10 euros extra. I don't think this is fair.'* (Seniors)

Additionally, not all available transport options were known by all participants. This especially holds for the local 'stop taxi' system. Those who did hear of it, considered it be too complex and unclear, making it less of an option to even consider:

*'That stop taxi, even I don't get it. Am I really that stupid? I just don't get it.'* (Seniors)

#### **4.2.2 Social network**

When one's (perceived) competences are barriers in reaching activities at distance, one's social network (or social capital) can mitigate these disadvantages. Especially when trips are only (perceived to be) suitable by car, the participants reported to rely heavily on their social network. Adolescents are often driven by their own or their friend's parents to sports or social activities. This places a burden on family members who are able to drive, which may constrain them in their activity patterns:

*'It feels like you've been running your own taxi company for years. Picking [the children] up from Terneuzen or if it was after 10 o'clock from Goes.'* (Commuters)

A similar picture can be drawn for the elderly, who rely on family or their partner to drive them to activities. However, in contrast to the adolescents, seniors pictured this dependence as more problematic. They feel burdened when asking family or friends too much and worry about their future mobility potential if the person(s) they rely on also lose the ability to drive:

*'I just don't want to think about when my partner and I both can't drive a car anymore, then I don't want to live here anymore.'* (Seniors)

### **4.3 Geography**

#### **4.3.1 Time-space constraints**

Taking the large distances to activities relative to more urban environments into account, activity patterns can still be constrained even when there are no limitations on transport options and the (perceived) ability to use it due to long travel times. With respect to car use, the peninsular structure of the region makes the road network fragile when disruptions occur, especially at the toll tunnel. However, using public transport to cover long distances was perceived to be difficult due to longer travel times and trip complexity. Especially during weekends, public transport starts running too late to be early at some destination outside the region. With respect to the return trip, some participants urged the dependence on family members on the destination site to stay overnight, as public transport stops running in the evenings:

*'Then I'll just call my daughter in Goes and say, I'm going to sleep at your place tonight.'* (Seniors)

Some participants reported that increasing distances to specific services eventually will lead to a wish to move out of their current residential area. This especially came to the fore when increased distances are combined with a risk of losing mobility options:

*'If I and my wife are not able anymore to get to the general practitioner in time because both of us can't drive anymore, that feels scary.'* (Seniors)

#### **4.3.2 Local norms**

The peripheral geography has shaped attitudes towards transport and accessibility through local social norms. The dominant position of the car as the most common mode to use became clear in all group discussions, as other transport modes were repeatedly compared against the car in terms of travel speed, comfort and reliability. This norm may have led to the observation that car-ownership is desirable, reflected in the attitudes adolescents reported when reflecting on their future mobility strategies:

*'I'm going for the car anyway, not a moped or a scooter.'* (Adolescents)

On a more fundamental level, participants stated that they do not understand why no action is taken to improve their accessibility and to feel left behind by the government in this sense. This is especially the case for participants from Sealandic Flanders, who repeatedly reported to feel locked out and excluded from the rest of the Netherlands as there is no easy way to cross the water:

*'That we don't matter. I think that's an overall feeling. I think that, as a region, we already feel like we're behind the rest of the Netherlands.'* (Commuters)

Participants from Sealandic Flanders consistently set themselves apart from the rest of the province which is referred to as 'the other side' or 'Zeeland'. This (perceived) isolation, in which activities in other parts of Zeeland are not even considered, has led to a focus on Belgium with respect to activity participation:

*'Ghent is for Sealandic Flanders the alternative where you're going. You just don't go to the other side, if you do something you go to Belgium.'* (Commuters)

## **5 Discussion**

Synthesising the experiences of daily travel barriers from the participants, it can be argued that, next to instrumental factors, perceptions embedded in the local geography play a role in the evaluation of one's experienced accessibility. The appropriation of transport options seems to be not only determined by physical and economic constraints. As already coined by Kaufmann et al. (2004), cognitive factors such as evaluations of the quality of the transport system and perceived competences with respect to using and planning it (i.e. knowledge about the transport system) are found to be crucial in one's perceived potential to be mobile. These evaluations seem to be coloured by negative experiences, as these were reported more vocally and frequently upon than positive experiences across all groups. This bias may strengthen discrepancies between potential accessibility levels and how they are perceived.

The local geographical context plays its role in the mechanism behind transport poverty both in a direct as well as in an indirect way. Directly, large distances are likely to strengthen the barriers in the transport and social domains. Intuition from time-geography shows that larger distances impose lower possibilities to engage in multiple activities a day, even with a car available (Farber Páez, 2011). Also, larger distances add to the complexity of public transport journeys, increasing the risk of schedule disruptions and consequently perceptions of unreliability. When people are not able to travel independently, relying on social networks resulted in dependence relationships especially within households with children. Parents could become more limited in terms of activity participation as they are obliged to taxi their children, a constraint often coined in the time-geography literature (e.g. Farber Páez, 2011).

Indirectly, local social norms also seem to shape travel behaviour, in line with Ajzen (1991). In a geographical context in which many travel long distances (by car), the ability to cover greater distances and access to a car are increasingly important for inclusion and social status (Mattioli Colleoni, 2015). Determinants of quality such as travel times, journey complexity, experiences during waiting, and on-ride experiences such as the driving behaviour

of the bus driver and customer service were benchmarked against the use of the car. This may not be surprising as the car has been generally found to be the preferred mode (Steg, 2005), especially in rural areas (Steenbekkers Vermeij, 2013). Additionally, the benchmarking of other transport options towards the car was reflected by adolescents resolutely opting they would want a car as soon as possible, a trend also found by Nutley (2005) in the UK and Ireland. The only mentioned limiting factor with respect to the car were the financial costs of running it, which may be linked with car-related economic stress particularly found in rural regions (Smith et al., 2012). These strong positive local social norms towards car-use, reflected in the consistent benchmarking of other transport options to the car, do not hint to any possible adaptation of desired accessibility to the geographical environment (see Delbos Currie, 2011; Farrington Farrington, 2005; Lucas, 2004, 2006). It can be hypothesised that desires regarding accessibility, and therefore the experience of transport poverty, are relative with respect to what accessibility levels are considered 'normal' (Kenyon et al., 2002) reflected in local social norms. In regions characterised by high accessibility benefits from car use, such as peripheral rural areas with dense road networks providing linkages with major cities, those without cars will adopt their accessibility desires to the norm, which is using the car. Therefore, adapting accessibility desires may only be likely in regions where there is low inequality in accessibility potential across individuals (i.e. where low accessibility is 'normal'). In Sealandic Flanders, for example, geographical barriers (such as the toll tunnel) could impose limitations even to those with cars. Participants living there indeed hinted at feelings of isolation and exclusion from other parts of the Netherlands, which has led in activities in other parts of Zeeland not even being considered to engage in. However, no hints of lowering accessibility desires could be distinguished, as many inhabitants of Sealandic Flanders shift their activity spaces towards Belgium.

Therefore, the identification of transport poverty on the basis of accessibility thresholds may lack central elements as the individual appropriation of accessibility and how this appropriation is embedded in the local geographical context are missed out on. These instrumental measures might rather be seen as setting the scene for potential accessibility, while the extent to which individuals recognise and utilise this potential will vary. The factors addressed above that seem to capture this appropriation of potential accessibility might explain discrepancies found between perceptions of accessibility and potential accessibility measures (e.g. Lättman et al., 2018). This also entails that when designing responsive policy measures to enhance the accessibility of those at risk of transport poverty, these appropriations, which are partly shaped by the local geographical context, should be taken into account. Otherwise there might be a risk that implemented solutions that enhance potential accessibility levels are discarded by the target group due to negative appropriations beforehand.

## 6 Conclusions

This paper has examined mechanisms behind the occurrence of transport poverty (i.e. inaccessibility to activities) in peripheral rural areas in the Netherlands by evaluating perceptions on mobility from commuters. Building on Lucas' (2012) model of transport-related exclusion, perceptions on the transport system (supply side); one's own competences (demand side) and geographical factors have been addressed during semi-structured focus group discussions with commuters, school-going adolescents and seniors.

The analysis has shown that the mechanisms behind transport poverty are more complex than just instrumental and observable factors such as transport availability, socio-demographic characteristics and land use structures. While these instrumental factors set the scene for potential accessibility of activities, a complex interplay of qualitative elements determine actual perceptions of accessibility (see Kaufmann et al., 2004) and possible experiences of transport poverty in peripheral rural areas. These elements include: knowledge on the availability and the use of transport options; evaluations on the reliability of travel modes; perceptions of safety; on-ride comfort and quality of service; and perceptions on what can be asked from social networks. These perceptions seem to be shaped by local social norms embedded in the local context. The peripheral geography does not only add to the risk of transport poverty in a direct way through a wider dispersion of activities and a lack of transportation possibilities. Social norms related to the dominance of the car seem to add to the negative appropriation of other transport options.

Additionally, collective feelings of ‘left-behind’ by the government seem to contribute to the feeling of exclusion. Therefore, it can be argued that considering subjective appropriations regarding the transport system and individual abilities, which are at least partly shaped by the local geographical context, will add to the understanding of the nature of accessibility problems in that region and will be valuable in designing responsive policies.

A limitation of the use of focus groups may be that participants are not willing to discuss sensitive topics like social exclusion as a result of inaccessibility to activities. To examine this link, in-depth interviews can be held to make these more sensitive topics discussable. Also, further research can be conducted in evaluating determinants of accessibility problems in other contexts. This would deepen the understanding of geography in shaping local social norms. Another promising avenue of research would be to attempt to model the interrelationships between potential accessibility and one’s own appropriation of transport options (i.e. motility from Kaufmann et al., 2004), however measures related to motility are still to be developed (Shliselberg Givoni, 2018). A final line of further research could be on how (smart) mobility solutions in rural areas could be more responsive to the needs of inhabitants considering how perceptions of experienced accessibility are shaped.

## References

- Ahern, A. & Hine, J. (2012). Rural transport – Valuing the mobility of older people. *Research in Transportation Economics*, 34(1), 27–34. doi:[10.1016/J.RETREC.2011.12.004](https://doi.org/10.1016/J.RETREC.2011.12.004)
- Ajzen, I. (1991). The theory of planned behavior. *Organizational Behavior and Human Decision Processes*, 50, 170–211. doi:[10.1016/0749-5978\(91\)90020-T](https://doi.org/10.1016/0749-5978(91)90020-T)
- Bosworth, G. & Venhorst, V. (2017). Economic linkages between urban and rural regions-what’s in it for the rural? *Regional Studies*, 52(8), 1075–1085. doi:[10.1080/00343404.2017.1339868](https://doi.org/10.1080/00343404.2017.1339868)
- Currie, G. & Delbosc, A. (2010). Modelling the social and psychological impacts of transport disadvantage. *Transportation*, 37, 953–966. doi:[10.1007/s11116-010-9280-2](https://doi.org/10.1007/s11116-010-9280-2)
- Dargay, J. M. (2002). Determinants of car ownership in rural and urban areas: a pseudo-panel analysis. *Transportation Research Part E: Logistics and Transportation Review*, 38(5), 351–366. doi:[10.1016/S1366-5545\(01\)00019-9](https://doi.org/10.1016/S1366-5545(01)00019-9)
- Delbosc, A. & Currie, G. (2011). The spatial context of transport disadvantage, social exclusion and well-being. *Journal of Transport Geography*, 19(6), 1130–1137. doi:[10.1016/J.JTRANGE0.2011.04.005](https://doi.org/10.1016/J.JTRANGE0.2011.04.005)
- Farber, S. & Páez, A. (2011). Running to stay in place: the time-use implications of automobile oriented land-use and travel. *Journal of Transport Geography*, 19(4), 782–793. doi:[10.1016/J.JTRANGE0.2010.09.008](https://doi.org/10.1016/J.JTRANGE0.2010.09.008)
- Farrington, C. & Farrington, J. (2005). Rural accessibility, social inclusion and social justice: towards conceptualisation. *Journal of Transport Geography*, 13, 1–12. doi:[10.1016/j.jtrangeo.2004.10.002](https://doi.org/10.1016/j.jtrangeo.2004.10.002)
- Geurs, K. T. & Van Wee, B. (2004). Accessibility evaluation of land-use and transport strategies: review and research directions. *Journal of Transport Geography*, 12, 127–140. doi:[10.1016/j.jtrangeo.2003.10.005](https://doi.org/10.1016/j.jtrangeo.2003.10.005)
- Gray, 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. doi:[10.1016/S0743-0167\(00\)00035-8](https://doi.org/10.1016/S0743-0167(00)00035-8)
- Haartsen, T., Huigen, P. P., & Groote, P. (2003). Rural areas in the Netherlands. *Tijdschrift voor Economische en Sociale Geografie*, 94(1), 129–136. doi:[10.1111/1467-9663.00243](https://doi.org/10.1111/1467-9663.00243)
- Haartsen, T. & Venhorst, V. (2010). PLanning for decline: Anticipating on population decline in the Netherlands. *Tijdschrift voor Economische en Sociale Geografie*, 101(2), 218–227. doi:[10.1111/j.1467-9663.2010.00597.x](https://doi.org/10.1111/j.1467-9663.2010.00597.x)
- Jonkers, E., Schepers, B., Tanis, J., & Zwart, G. (2019). *Sociale inclusie en vervoersarmoede in de provincie*. Panteia. Zoetermeer.
- Jorritsma, P., Berveling, J., Haas, M. D., Bakker, P., & Harms, L. (2018). *Mobiliteitsarmoede: vaag begrip of concreet probleem?* Kennisinstituut voor Mobiliteitsbeleid. The Hague.
- Kamruzzaman, M. & Hine, J. (2012). Analysis of rural activity spaces and transport disadvantage using a multi-method approach. *Transport Policy*, 19(1), 105–120. doi:[10.1016/J.TRANPOL.2011.09.007](https://doi.org/10.1016/J.TRANPOL.2011.09.007)
- Kaufmann, V., Bergman, M. M., & Joye, D. (2004). Motility: Mobility as capital. *International Journal of Urban and Regional Research*, 28(4), 745–756. doi:[10.1111/j.0309-1317.2004.00549.x](https://doi.org/10.1111/j.0309-1317.2004.00549.x)

- Kenyon, S. (2011). Transport and social exclusion: access to higher education in the UK policy context. *Journal of Transport Geography*, 19(4), 763–771. doi:10.1016/J.JTRANGE0.2010.09.005
- Kenyon, S., Lyons, G., & Rafferty, J. (2002). Transport and social exclusion: investigating the possibility of promoting inclusion through virtual mobility. *Journal of Transport Geography*, 10, 207–219. doi:10.1016/S0966-6923(02)00012-1
- Kitamura, R., Mokhtarian, P. L., & Laidet, L. (1997). A micro-analysis of land use and travel in five neighborhoods in the San Francisco Bay Area. *Transportation*, 24, 125–158.
- Lättman, K., Olsson, L. E., & Friman, M. (2018). A new approach to accessibility – Examining perceived accessibility in contrast to objectively measured accessibility in daily travel. *Research in Transportation Economics*, 69, 501–511. doi:10.1016/J.RETREC.2018.06.002
- Lucas, K. (2004). *Running on empty: transport, social exclusion and environmental justice*. Bristol: The Policy Press.
- Lucas, K. (2006). Providing transport for social inclusion within a framework for environmental justice in the UK. *Transportation Research Part A: Policy and Practice*, 40(10), 801–809. doi:10.1016/j.tra.2005.12.005
- Lucas, K. (2012). Transport and social exclusion: Where are we now? *Transport Policy*, 20, 105–113. doi:10.1016/j.tranpol.2012.01.013
- Mackett, R. L. & Thoreau, R. (2015). Transport, social exclusion and health. *Journal of Transport & Health*, 2(4), 610–617. doi:10.1016/J.JTH.2015.07.006
- Mattioli, G. & Colleoni, M. (2015). Transport Disadvantage, Car Dependence and Urban Form. In *Understanding mobilities for designing contemporary cities. research for development*. Cham: Springer International.
- Milakis, D. & van Wee, B. (2018). For me it is always like half an hour: exploring the acceptable travel time concept in the us and european contexts. *Transport Policy*, 64, 113–122. doi:10.1016/J.TRANPOL.2018.02.001
- Milbourne, P. & Kitchen, L. (2014). Rural mobilities: Connecting movement and fixity in rural places. *Journal of Rural Studies*, 34, 326–336. doi:10.1016/J.JRURSTUD.2014.01.004
- Nordbakke, S. (2013). Capabilities for mobility among urban older women: barriers, strategies and options. *Journal of Transport Geography*, 26, 166–174. doi:10.1016/J.JTRANGE0.2012.10.003
- Nutley, S. (2005). Monitoring rural travel behaviour: A longitudinal study in Northern Ireland 1979-2001. *Journal of Transport Geography*, 13, 247–263. doi:10.1016/j.jtrangeo.2004.07.002
- PBL. (2019). Feiten en cijfers over krimp. Retrieved from <https://www.pbl.nl/onderwerpen/krimp/feiten-en-cijfers>
- Preston, J. & Rajé, F. (2007). Accessibility, mobility and transport-related social exclusion. *Journal of Transport Geography*, 15, 151–160. doi:10.1016/j.jtrangeo.2006.05.002
- Scott, D. M. & Horner, M. W. (2008). The role of urban form in shaping access to opportunities. *Journal of Transport and Land Use*, 1(2), 89–119. doi:10.5198/jtlu.v1i2.25
- Smith, N., Hirsch, D., & Davis, A. (2012). Accessibility and capability: the minimum transport needs and costs of rural households. *Journal of Transport Geography*, 21, 93–101. doi:10.1016/J.JTRANGE0.2012.01.004
- Social Exclusion Unit. (2003). *Making the Connections: Final Report on Transport and Social Exclusion*. doi:10.1126/science.294.5544.953d
- Stanley, J. K., Hensher, D. A., Stanley, J. R., & Vella-Brodrick, D. (2011). Mobility, social exclusion and well-being: Exploring the links. *Transportation Research Part A: Policy and Practice*, 45(8), 789–801. doi:10.1016/J.TRA.2011.06.007
- Statistics Netherlands. (2017). Banen van werknemers naar woon- en werkregio. Retrieved from <https://statline.cbs.nl/Statweb/selection/?VW=T&DM=SLNL&PA=83628NED&D1=1&D2=1%5C%2c55-84%5C%2c86-91%5C%2c93-173%5C%2c175-258%5C%2c260-274%5C%2c276-283%5C%2c285-318%5C%2c320-346%5C%2c348-352%5C%2c354-366%5C%2c368-387%5C%2c389-410%5C%2c412-459&D3=1&D4=1&HDR=G3%5C%2cT%5C%2cG2&STB=G1>
- Statistics Netherlands. (2018). *Risico op vervoersarmoede: een eerste aanzet tot een indicator*. Centraal Bureau voor de Statistiek. The Hague.

- Statistics Netherlands. (2019). Regionale kerncijfers Nederland. Retrieved from <https://statline.cbs.nl/Statweb/publication/?DM=SLNL%7B%5C%7DPA=70072NED%7B%5C%7DD1=56%7B%5C%7DD2=14%7B%5C%7DD3=23%7B%5C%7DHDR=T%7B%5C%7DSTB=G1,G2%7B%5C%7DVW=T>
- Steenbekkers, A. & Vermeij, L. (2013). *De dorpenmonitor*. Sociaal en Cultureel Planbureau. The Hague.
- Steg, L. (2005). Car use: lust and must. Instrumental, symbolic and affective motives for car use. *Transportation Research Part A: Policy and Practice*, 39(2-3), 147–162. doi:10.1016/J.TRA.2004.07.001
- Tillema, T., Jorritsma, P., & Harms, L. (2019). *Bevolkingsdaling en de effecten op de bereikbaarheid en mobiliteit in Nederland*. Kennisinstituut voor Mobiliteitsbeleid. The Hague.
- Urry, J. (2004). The 'System' of Automobility. *Theory, Culture & Society*, 21(4-5), 25–39. doi:10.1177/0263276404046059
- Van Acker, V., Van Wee, B., & Witlox, F. (2010). When Transport Geography Meets Social Psychology: Toward a Conceptual Model of Travel Behaviour. *Transport Reviews*, 30(2), 219–240. doi:10.1080/01441640902943453
- Van Dam, F., De Groot, C., & Verwest, F. (2006). *Krimp en Ruimte: Bevolkingsafname, Ruimtelijke Gevolgen en Beleid*. NAI Uitgevers/Ruimtelijk Planbureau. Rotterdam/The Hague.
- Veeneman, W., Augustin, K., Enoch, M., Faivre d'Arcier, B., Malpezzi, S., & Wijmenga, N. (2015). Austerity in public transport in Europe: The influence of governance. *Research in Transportation Economics*, 51, 31–39. doi:10.1016/J.RETREC.2015.07.005