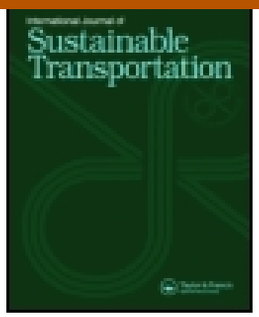

International Journal of Sustainable Transportation

ISSN: 1556-8318 (Print) 1556-8334 (Online) Journal homepage: http://www.tandfonline.com/loi/ujst20

The potential role of employers in promoting sustainable mobility in rural areas: Evidence from Eastern Austria

Michael Soder & Stefanie Peer

To cite this article: Michael Soder & Stefanie Peer (2017): The potential role of employers in promoting sustainable mobility in rural areas: Evidence from Eastern Austria, International Journal of Sustainable Transportation, DOI: 10.1080/15568318.2017.1402974

To link to this article: https://doi.org/10.1080/15568318.2017.1402974

INTERNATIONAL JOURNAL OF SUSTAINABLE TRANSPORTATION
2017, VOL. 0, NO. 0, 1–11
https://doi.org/10.1080/15568318.2017.1402974

Taylor & Francis
Taylor & Francis Group

The potential role of employers in promoting sustainable mobility in rural areas: Evidence from Eastern Austria*

Michael Soder[a] and Stefanie Peer[b]

[a]Institute for Ecological Economics, Vienna University of Economics and Business, Vienna, Austria; [b]Department of Socioeconomics, Vienna University of Economics and Business, Vienna, Austria

ABSTRACT

In industrialized countries, mobility represents one of the most important sources of CO_2 emissions. Most research on promoting sustainable, climate-friendly modes of transportation has focused on urban areas. Rural areas—although characterized by high dependency on individual car ownership and usage—have received less attention. This article explores the potential role of rural employers in supporting sustainable alternatives to commuting by (single-occupied) motorized vehicles among their employees. We conduct a collective case study that considers five employers located in Eastern Austria (Burgenland), drawing from multiple data sources including structured surveys, expert interviews, focus groups, and site visits. Our analysis shows that employers have little incentive to implement measures that foster sustainable mobility among their employees. On the one hand, the costs accruing to employers for implementing such measures tend to exceed the corresponding benefits by a significant margin (unlike in urban areas where significant cost reductions can arise for employers). On the other hand, also employees generally exhibit little demand for such measures. We conclude that both from a societal and a business perspective, it is not efficient to promote sustainable mobility in rural areas *via employers*.

ARTICLE HISTORY
Received 23 January 2017
Revised 6 November 2017
Accepted 6 November 2017

KEYWORDS
Commuting; employers; mobility management; rural areas; sustainable mobility

1. Introduction

Mobility in rural areas of the developed world relies heavily on individual car ownership and usage (Hanson & Hildebrand, 2011; Pucher & Renne, 2005). Without car access, social inclusion and employment opportunities can be significantly impeded (Fol, Dupuy, & Coutard, 2007; Osti, 2010; Mattioli, 2014). From an environmental perspective, this type of mobility is – due to the emissions of CO_2 and local pollutants—considered undesirable. Alternatives that correspond more closely to the idea of a sustainable transportation system,[1] however, are costly to implement. Dispersed settlement structures render it generally difficult to supply an efficient public transport system, and due to long commuting distances (e.g., 66.4% of the employees surveyed for this study have a commuting distance above 15 km), unmotorized modes of transportation tend to have only a secondary role as a commuting mode.

Due to the importance of car ownership for employment opportunities, and since the daily travel to and from work represents a major trip generator (Unbehaun, Uhlmann, Hader, Aschauer, & Gerike, 2014), employers potentially have a large role in affecting travel behavior as they can actively engage in measures that support alternative transport modes among their employees on their daily trip to work. Previous studies have cited a large number of measures that employers can implement to support sustainable transport alternatives among employees (Dickinson, Kingham, Copsey, & Hougie, 2003; Enoch & Potter, 2003; Van Malderen, Jourquin, Thomas, Vanoutrive, Verhetsel, & Witlox, 2012; Vanoutrive, Van Malderen, Jourquin, Thomas, Verhetsel, & Witlox, 2010). For instance, employers can promote sustainable mobility by establishing shuttle buses, subsidizing free public-transport passes, investing in infrastructure (e.g., bike sheds, showers, preferred parking for those who car-pool), or by enabling car-pooling. Awareness-raising initiatives with respect to benefits of sustainable transport modes, the coordination of work–time schemes and opportunities for teleworking represent other conceivable measures. Depending on which of these measures (and how they) are implemented, employers may benefit from gaining a better reputation among (future and current) clients and employees, decreased costs due to less demand for employee parking lots and improvements in accessibility that may also benefit clients and suppliers.

Rural mobility has been investigated in numerous studies, most of which agree on the dominant and indispensable role of the private car, and the resulting lack of environmental

CONTACT Michael Soder michael.soder@wu.ac.at Institute for Ecological Economics, Vienna University of Economics and Business, Welthandelsplatz 1, 1020 Vienna, Austria.

Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/ujst.

*The authors wish to thank the European Regional Development Fund and the Austrian Federal Ministry of Agriculture, Forestry, Environment and Water Management (BMLFUW) for funding of the project "Eco-mobility in the Austro-Hungarian border region" (EMAH). We also want to thank the anonymous reviewers for their helpful comments and suggestions.

[1]Although (environmentally) sustainable transportation is not univocally defined, it generally refers to the notion of a transport system that—based on the environmental costs that are associated with it—can be sustained in the long run (e.g., Greene & Wegener, 1997; Litman, 2007; Verhoef, Ubbels, Rodenburg, & Nijkamp, 2001).

sustainability (Shergold, Parkhurst, & Musselwhite, 2012; Pucher & Renne, 2005; Osti, 2010). In this study, we focus on the potential role of rural employers in stimulating sustainable transport modes among their employees, and explore the associated boundaries and obstacles. We are not aware of any previous study on rural mobility that is centered around the role of employers. Various earlier papers have investigated the influence of employers on mode choice decisions of their employees, and their potential role in supporting sustainable mobility (Curtis, 2008; Hickman, R., Hall, P., & Banister, 2013; Hull, 2008). However, these studies have almost exclusively focused on urban employers. We will highlight in this article that employers located in rural areas face very different challenges in promoting sustainable forms of mobility among employees compared to urban environments.

The article follows a collective case study approach comprising five employers in Burgenland, a rural region in Eastern Austria, which is characterized by a high car dependency and still increasing car ownership rates.[2] It draws on multiple data sources, including structured surveys among employees, semi-structured interviews with employer representatives, focus groups, and site visits.

In our study, we find little evidence that employers in rural environments are interested and willing to promote sustainable mobility among their employees. Our analysis shows that the specific characteristics of rural areas (e.g., dispersed settlement structures, long commuting distances, limited public transport provision) render employer-driven mobility measures inefficient and cost-intensive. Potential benefits such as the creation of an image of being "green" or being an attractive employer tend to be too vague and usually not directly translatable into financial terms. Moreover, the surveyed employees do not exhibit much demand for such measures either, and, if they do, these measures tend to be outside the employers' scope of influence (e.g., improvements in the public transport system). Our results also indicate that the largest potential for sustainable mobility promoted by employers seems to be realizable when employers are active in the tertiary sector, more specifically in situations where not only employees, but also clients can take advantage of measures and investments that foster sustainable mobility.

The article unfolds as follows. Section 2 discusses the background and context of the study. Section 3 contains information on the case selection. Section 4 provides the case data, both concerning employers as well as employees. Section 5 discusses the feasibility of employer-driven mobility measures in rural environments and it elaborates on the reasons for employer inactivity in supporting sustainable mobility among employees. Based on these findings, Section 6 provides policy recommendations, and discusses the potential implications of recent technological developments in the transport sector for rural mobility.

2. Background

2.1. *Economic and geographical context*

The research presented in this article was carried out in Burgenland (Eastern Austria). Burgenland is Austria's smallest federal state with ca. 290,000 inhabitants. Although it has the lowest gross regional product per capita of the nine Austrian federal states,[3] it has a rather good employment record: in 2015, the unemployment rate amounted to 5.2 %, whereas the Austrian average amounted to 5.7 %.[4] Burgenland is also characterized by a distinctive North–South divide in terms of economic performance, with the Northern part (located close to Vienna) performing significantly better than the peripheral Southern part. Figure 1 shows a map of Burgenland, major transport infrastructure, and the locations of the employers participating in this study.

A large majority of the population lives in rural, dispersed settlement structures (Burgenlands' capital city Eisenstadt has only 13,500 inhabitants),[5] typically entailing long commuting distances (often to other federal states, most importantly Vienna and Styria[6]), and high rates of car ownership and car usage. For instance, car ownership amounted to 640 cars per 1000 inhabitants in 2015 (compared to the Austrian average of 546).[7] In 2013/14, according to a large-scale, representative survey, 71% of all trips in Burgenland (during weekdays) were made by car (compared to the Austrian average of 59%, and the Austrian average for peripheral regions of 70%), whereas public transport was only used for 8% of all trips (compared to the Austrian average of 17%, and the Austrian average for peripheral regions of 8%). Moreover, the average distance covered by persons living in Burgenland on weekdays is 44 km, whereas the corresponding Austrian average is 36 km.[8] The indicators show that the mobility patterns in Burgenland resemble those of peripheral areas in Austria in general.

Up to now, more environmentally-friendly motorized modes of transportation such as hybrid-electric or electric cars have played only a negligible role in Burgenland, with relative shares of 0.21% and 0.05% (in 2015), respectively.[9] Compared to other European regions, Burgenland with its 640 cars per 1,000 inhabitants ranks among the top 20 regions (at the NUTS 2 level) with the highest number of passenger cars. Other regions with similar car ownership rates are regions in Northern Italy (e.g., Abruzzo, Tuscany), Luxembourg, and regions in the UK (e.g., Berkshire, Buckinghamshire, Oxfordshire).[10]

[2] In Burgenland, the number of cars per 1000 inhabitants rose from 570.2 in 2004 (Austrian average: 504.8) to 639.5 in 2014 (Austrian average: 547.2); http://www.statistik.at/web_de/statistiken/verkehr/strasse/kraftfahrzeuge_-_bestand/, 03.10.2016

[3] In 1995, the European Union had declared Burgenland a so-called "target-one region", implying that Burgenland became eligible for extensive funding targeted at stimulating economic development. The funding program phased out in 2013.

[4] http://www.statistik.at/web_de/services/wirtschaftsatlas_oesterreich/oesterreich_und_seine_bundeslaender/index.html, 03.10.2016

[5] The strongly dispersed nature of housing and business locations in Burgenland can at least partially be attributed to decisions concerning land use being mostly taken at the municipal level. Due to redistribution rules of federal tax revenues, municipalities have an incentive to compete for both households and firms to locate within their municipal borders. One important form of competition between municipalities is the non-restrictive handling of zoning regulations.

[6] In 2014, 36.6% of the working population in Burgenland was employed outside Burgenland, http://www.statistik.at/wcm/idc/idcplg?IdcService=GET_PDF_FILE&RevisionSelectionMethod=LatestReleased&dDocName=078529, 03.10.2016

[7] http://www.statistik.at/web_de/statistiken/verkehr/strasse/kraftfahrzeuge_-_bestand/, 03.10.2016

[8] https://www.bmvit.gv.at/verkehr/gesamtverkehr/statistik/oesterreich_unterwegs/downloads/oeu_2013-2014_Ergebnisbericht.pdf, 21.12.2016

[9] http://www.statistik.at/web_de/statistiken/energie_umwelt_innovation_mobilitaet/verkehr/strasse/kraftfahrzeuge_-_bestand/index.html, 03.10.2016

[10] http://ec.europa.eu/eurostat/statistics-explained/index.php/Transport_statistics_at_regional_level#Motorisation_rate_for_passenger_car, 15.05.2017

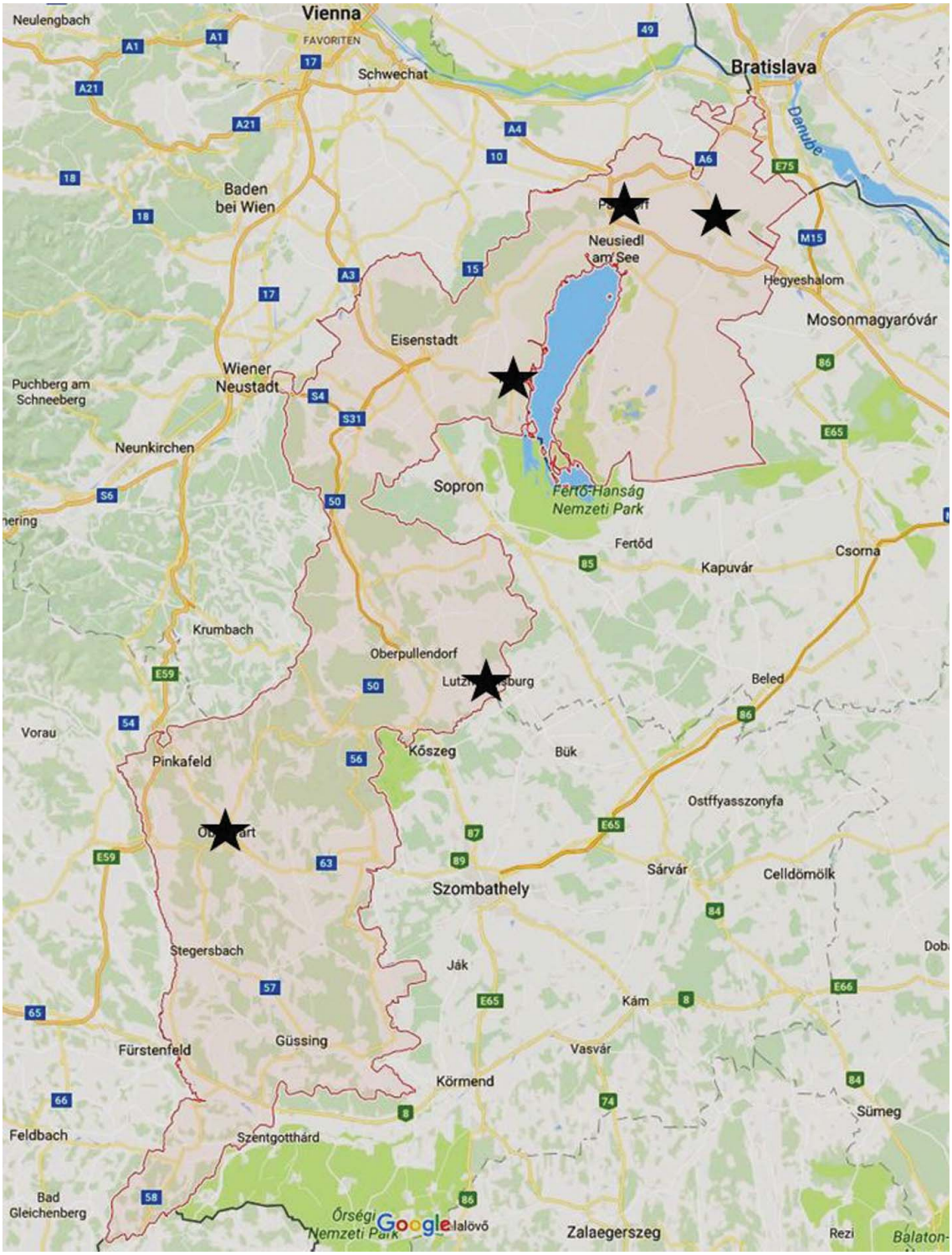

Figure 1. The geographic region of Burgenland and the locations of the participating employers marked with a star, S: Google Maps.

2.2. *Policy context*

Most transport policies and regulations that are of relevance to this study are determined at the national level. In Austria, commuting is mainly subsidized through tax allowances.[11] These are granted to every employee who fulfills the following requirements: (1) the distance between home and work exceeds 20 km, (2) public transport is not a viable alternative, and (3) the person commutes on a regular basis. The tax allowance depends on the distance and number of weekly commutes, and ranges from 31 to 306 Euro per month.[12] Some Austrian

[11] The most important commuting subsidies in Austria are the 'Pendlerpauschale' and the 'Pendlereuro'. Since 2013, all employees who are eligible for the 'Pendlerpauschale' also receive the 'Pendlereuro'.

[12] https://www.help.gv.at/Portal.Node/hlpd/public/content/193/Seite.800600.html, Bundeskanzleramt Österreich, 13.03.2016

provinces including Burgenland[13] provide additional subsidies to commuters.

While these subsidies for commuting may generate some positive effects on the labor market (e.g., by improved matching between job requirements and qualification levels, and by providing incentives to be active on the labor market (e.g. Wrede, 2014)), they also create substantial negative effects: they increase commuting distances and traffic volume, and induce further dispersion of settlements (Su & Desalvo, 2008; Umweltdachverband, 2014). As approximately 35% of all Austrian employees (and hence a substantial share of voters) receive these subsidies, their abolition, or reduction (or, a change in eligibility criteria with the aim to incentivize the use of environmentally friendly commuting modes[14]) is politically difficult to implement (Steuerreform Kommission, 2014).[15]

Additionally, an umbrella program of subsidies (*klima:aktiv*) exists with the aim of reducing CO_2 emissions, fostering green technology and green behavior. It defines mobility as one of four target areas. The program, however, does not target individual commuters, but offers financial support to private and public entities for a broad range of measures that range from information campaigns to the construction and adoption of energy-efficient infrastructure.[16] The program serves mainly as a funding scheme for small-scale (pilot) projects, usually with a limited geographical scope. Its financial volume is limited (67 million Euro in 2014)[17], especially compared to the volume of the above-mentioned federal tax allowances for commuting (560 million Euro in 2014; Steuerreform Kommission 2014).

3. Methodology and case selection

We conduct a collective case study,[18] involving five employers located in Burgenland, with the aim to investigate the feasibility and effectiveness of employer-based mobility policies in rural areas.

3.1. *Data sources*

Case studies are a widely applied research method in social sciences. They consist of an in-depth analysis of one or multiple cases, involving exploration, illustration and explanation of the relevant variables. Strong emphasis is placed on the contextual characteristics of a case, for instance regarding geography, culture or history. As a consequence, case studies are usually based on multiple data sources such as structured surveys, interviews, relevant documents and observations of the analyst. See, for instance, Yin (2003), Creswell, Hanson, Plano, & Morales (2007), or Baxter & Jack (2008) for more detailed information concerning research based on case studies.

Here, we select five employers in Burgenland. We will base our policy recommendations and conclusions on the following data sources, which are gathered for each employer:

- **(Structured) survey data from employees.** A paper and pencil survey was handed out to the employees of each participating organization. It contained questions concerning their travel behavior and socio-economic characteristics.
- **Interviews with managers and work council members.** We carried out nine semi-structured interviews with employer representatives and work council members. The interviews mainly aimed at exploring the attitudes of employers and work council members toward stimulating sustainable mobility among employees, as well as their perception of viable options for doing so.
- **Site visits.** The site visits were mainly undertaken to investigate the transport infrastructure available in the surroundings of each participating organization. They were documented using written notes and photographs (a.o. of bus stops, bus timetables, bike sheds).

Finally, we conducted focus groups with managers and employees in two of the participating firms. In these focus groups, general knowledge about different forms of mobility, their personal assessment of the potential and feasibility of alternatives to the car for the daily trip to and from work, and site-specific possibilities for measures targeted at promoting sustainable mobility were discussed.

3.2. *Methodology*

To analyze the material collected from the survey, we use standard statistical software packages. The observations resulting from the site visits and their categorization (e.g., on whether a firm location is considered “attached” or ”detached”) have been discussed and agreed upon among the researchers who have participated in the site visit (2–5, among them the authors of this article).

The interviews and focus group discussions were audio recorded and transcribed, and analyzed using a qualitative content analysis. Conventional qualitative content analysis avoids the use of preconceived categories and codes when analyzing qualitative data. Instead, the method allows for categories and insights to emerge in the process of analysis. This approach is especially useful if the existing literature and theory on the research question at stake is limited (Braun & Clarke, 2006; Hsieh & Shannon, 2005), which is the case for employer-driven promotion of sustainable commuting in rural areas.

3.3. *Selection strategy*

The selection of cases is a crucial part of case study research. For a methodologically driven selection of cases, it is vital to first define a population from which the cases are drawn. In the context of this study, the relevant population consists of

[13] https://www.burgenland.at/gesundheit-soziales-arbeit/arbeit/arbeitnehmerfoerderung/fahrtkostenzuschuss/, 28.7.2017

[14] Currently, tax allowances exist for the purchase of seasonal public transport tickets, however, they are only granted if the employer agrees to provide them. In this case, a reduction in tax burden follows for both the employer as well as the employee. S: https://findok.bmf.gv.at/findok?execution=e100000s1&segmentId=77a2922c-cc1c-40c9-aff3-9c333fc4cc3e, 03.10.2016.

[15] http://statistik.at/web_de/statistiken/menschen_und_gesellschaft/arbeitsmarkt/erwerbstaetige/unselbstaendig_erwerbstaetige/index.html, Statistik Austria, 15.03.2016

[16] http://www.klimaaktiv.at/english/mobility.html, 16.02.2015

[17] http://www.klimaaktiv.at/publikationen/klimaaktiv/jahresbericht2014.html, 03.10.2016

[18] Collective case studies are case studies that are based on data from multiple cases (e.g. Stake, 2000). They are usually used to gain insights into a certain topic from various perspectives, and to understand certain phenomena better by analyzing them in different contexts.

employers located in Burgenland. Moreover, a participating organization should have at least 30 employees: as the data collection process involves both qualitative (interviews, focus groups) and quantitative (surveys) elements, each organization should exceed this minimum number of employees.

To achieve analytic generalizability in collective case analyses,[19] it is usually *not* recommendable to select cases from the population at random, but to select them in a purposeful way. Such a selection procedure is sometimes referred to as "strategic" (Ragin & Becker, 1992) or "information-oriented" (Flyvbjerg, 2006).[20] The main reason for using strategic (rather than statistical) sampling is that if one is confined to a relatively small sample for methodological and practical reasons, there are usually more insightful cases to study than randomly selected ones. Moreover, it is not recommended either to purposefully select typical (average, representative) cases. Besides the difficulty of identifying such cases, they may lack variation in the variables of interest, which renders analytical generalizations toward a wider theory difficult (Flyvbjerg, 2006; Pettigrew, 1990; Ragin & Becker, 1992).

For the employers recruited for this study, we aimed at variation in factors that may potentially affect their potential to promote sustainable transport modes among their employees as well as the adequacy and (potential) effectiveness of specific measures. We hypothesize the following factors to play a major role: economic sector, company size, accessibility level as well as current activities in promoting sustainable mobility (both among employees as well as clients). For instance, different economic sectors are usually associated with different types of jobs (e.g., blue vs. white collar work) and work–time arrangements, which in turn may affect to which extent employees are able to make use of specific types of sustainable mobility (e.g., carpooling). The sector will also affect to which extent specific measures can also be of use to clients/customers. Company size may partially determine the viability of investments in measures that support sustainable modes of transportation due to economies of scale, in particular when fixed costs for the implementation of these measures are present. Accessibility of the employer influences the effectiveness of specific measures and in turn the likelihood of them being implemented. Finally, employers that already have implemented measures to support environmentally-friendly transport modes may also be more open toward implementing additional measures, or on the contrary, they may consider their current measures sufficient.

3.4. *Recruitment strategy*

We approached ca. 40 employers (located in Burgenland and with more than 30 employees) in order to recruit the target number of five employers to participate in our study. In addition to these five participating employers, several employers among the approached ones were interested in participating, but their participation was dependent on the agreement of the parent company. As those five employers that were willing to confirm their participation immediately provided the necessary variation in the above-mentioned criteria, we did not follow up with the others. Overall, the interest to participate in the study was rather low among the majority of the organizations that we approached, even though in exchange for participating they were offered organizational and (limited) financial support in the implementation of measures aimed at supporting sustainable forms of mobility among their employees. It is therefore quite likely that self-selection biases are present in our sample: participating employers seem to have a higher interest in sustainable mobility than those who decided not to participate. We will come back to this observation in Sections 5 and 6.

4. Case data

4.1. *Characteristics of the selected employers*

The selected employers fit well the criteria outlined in Section 3.3, as we find sufficient variation in all key characteristics, including economic sector, company size, accessibility, and the presence of measures promoting sustainable mobility (see Table 1 for an overview).

Our cases consist of two firms active in the producing sector and three firms active in the service sector. The distribution of employers across sub-sectors closely reflects the economic structure in Burgenland.[21] Accessibility is measured by two different indicators: first, by the relative location of the company site to the nearest municipality (attached vs. detached), and second by the distance to the next public transport (PT) stop. The distance to the closest PT stop is fairly low for three out of the five employers (below 500 m). However, it should be noted this does not translate into high-frequency service: most bus lines run 4–8 times per day (in one direction). Those two employers located further away from a PT stop (with distances of 1.6 and 5.1 km, respectively) are both situated at a detached location. Employer 3 is located at a detached location as well (an extensive standalone facility with no other residential or commercial buildings located in its closer surroundings), but it has its own bus stop in front of the company site. Possibly due to the above-mentioned self-selection pattern, three out of the five employers have already implemented measures targeted at rendering mobility more environmentally friendly. These measures, which encompass bike rental services (BRS) and a shuttle bus (SB), have been implemented by employers in the service sector, but currently their use is restricted to clients only. We will discuss the implications of this pattern in more detail in Section 5.

4.2. *Characteristics of the employees*

The structured surveys conducted among employees mainly contained questions concerning commuting behavior and

[19] In case study research, the concept of analytic generalizability usually replaces statistical representativeness, since the number of cases that would be required to reach statistical representativeness almost always exceeds the number of cases that can be studied to such an extent that the context and uniqueness of each case is sufficiently understood, described and analyzed (Curtis, Gesler, Smith, & Washburn, 2000; Kohn, 1997; Seawright & Gerring, 2008; Yin, 2003).

[20] Also the terms "theoretical" (Eisenhardt, 1989; Creswell et al., 2007) and "qualitative" sampling (Curtis et al., 2000) are sometimes used to describe this procedure.

[21] http://www.burgenland.at/fileadmin/user_upload/Bilder/Wirtschaft_und_Arbeit/Arbeit-Leben-Wirtschaft3_WEB.pdf, Federal State of Burgenland, 30.03.2016

Table 1. Employer characteristics (source: site visits and interviews).

Employer	Sector	Sub-sector	Employees	Location	Distance to PT	Measures
1	Production	Construction	394	Attached	150 m	No
2	Service	Tourism	40	Attached	450 m	BRS
3	Service	Tourism	189	Detached	10 m	BRS
4	Production	Manufacturing	270	Detached	5.1 km	No
5	Service	Retail	1,390	Detached	1.6 km	SB, BRS

Table 2. Survey response rates.

Employer	Sample Size	Employees	Response Rate (in %)
1	49	394	12.44
2	7	40	17.50
3	145	189	76.72
4	103	270	38.15
5	62	1,390	4.46
Overall	366	2,283	16.03

socio-economic characteristics. An overall response rate of 16.03% has been achieved. The response rates at each participating employer are shown in Table 2. While the response rates differ substantially across employers, the overall response rate corresponds to the lower end of the average response rates in organizational research (Baruch & Holtom, 2008). Differences in the response rates can mainly be explained by differences in organizational structures of the firms and commitment of the management to achieve a high response.[22]

An overview of the socio-economic characteristics of the participating employees is provided in Table 3.[23] The obtained data exhibit a fairly balanced distribution with respect to gender (48.1% males, 51.9% females) and age. When it comes to the highest education level reached, persons with high school degrees (48.2%) and vocational training (30.2%) prevail. 90.3% of the respondents indicate they always have access to a car, while only 2.6% possess seasonal public transport passes.

To enrich the survey data, we also conducted nine interviews with employer representatives and work council members (at least one in each participating organization), as well as focus groups with employees and managers of Employers 4 and 5 (with eight and six participants, respectively).[24]

The main aim of the interviews, which lasted approximately 60 minutes each, was to explore employers' and work council members' attitudes toward stimulating sustainable mobility among employees, and their professional perception of whether employers can potentially play a role in promoting sustainable mobility in rural areas.

The focus groups aimed at investigating the current demand for mobility in general, and sustainable forms of transportation from an employee point-of-view. They took around 120 minutes and consisted of blue and white-collar workers as well as company representatives. In each focus group, female and male employees were present, and participants varied in age and period of employment at the current employer. Table 4 shows an overview of the composition of each focus group by gender and professional position of the participants.

Table 5 shows the modal split overall and for the five participating employers individually. In face of the economic, geographical and policy context (as described in Section 2) and the (local) characteristics of the employers, the high share of surveyed employees who use the car as primary commuting mode does not surprise: 93.5 % of the surveyed employees commute by (single-occupied) car, 3.6 % car-pool on their way to work, 1.3 % walk and only 1.6 % cycle to their workplaces. The modal share of public transport is 0.

Although driving by car (93.5 %) is clearly the dominant choice for traveling in Burgenland, it seems worthwhile to get a better understanding of those employees who make use of other modes of transport or car-pooling.[25] Table 6 shows the average commuting distances by travel mode. Unsurprisingly, walking and cycling as mode choices are limited to short distances (mostly below 3 km). The average commuting distance by car is 28 km and those who car-pool travel 59 km on average to their workplaces. Car-poolers thus tend to travel significantly longer distances than those who travel by car ($p = 0.0069$). This might indicate that employees try to share the costs of long commuting distances and that the efforts to coordinate common trips are more easily offset. Further, participants of the focus groups emphasized that the coordination effort is relatively higher for employees who have additional care responsibilities. In that case, the individual employees have to adapt their own mobility behavior to mobility demands arising from their care duties (e.g., bring and pick up children to and from school, etc.). The coordination of different mobility demands generally renders individual mobility patterns more complex and, in turn, mode alternatives such as car-pooling or cycling less likely to be used.

It is striking that nobody in our sample makes use of public transport on the daily trip to work. Table 7 presents the (self-reported) commuting distance between home and work as well as the walking time between home and the next access point to the public transport system. While the commuting distance determines the feasibility of cycling and walking, the walking time to the closest public transport stop is an indicator for accessibility of the public transport system.

Our data show that 46.82 % of the surveyed employees generally have the possibility to access the public transport system within 5 minutes and 70.24 % within 10 minutes walking. In almost all cases, the public transport access points correspond to bus stations, and according to the timetables most bus lines tend to run 4–8 times per day. Due to the dispersed location of households and employers, direct bus connections between home and work are rare. Without direct connection, public transport travel times are easily 2–3 times higher than the corresponding car travel times. But even in the rare cases with a

[22] For instance, Employer 5 represents an organization that administrates a shopping mall with more than 160 individual shops. The administration only employs 30 persons and has no direct access to all employed persons working at the company site. The management of the individual shops therefore had to individually agree that their employees are allowed to participate.

[23] Differences in *N* can be explained by differences in the response to individual questions.

[24] We selected those two employers for practical reasons, but also because they provide variation in already implemented mobility measures (no vs. yes) and economic sector (production vs. service).

[25] Such an approach of looking into the exceptions is for instance strongly advocated by Becker (2008).

Table 3. Socio-economic characteristics of the surveyed employees.

Gender		Education		Age	
N = 293	%	*N* = 292	%	*N* = 292	%
Male	48.1	No Graduation	0.3	15–20	2.0
Female	51.9	Compulsory School	5.5	21–30	23.7
		Vocational Training	30.2	31–40	30.7
		High School	48.2	41–50	28.7
		University	15.8	51–60	13.5
				>60	1.4
Income(€ /Month)	%	PT Ticket		Car Availability	
N = 294	%	N = 302	%	*N* = 298	%
<1,000	7.5	No Ticket	96.7	Always	90.3
1,001–1,500	24.1	Season Ticket	2.6	Sometimes	7.7
1,501–2,000	20.1	Reduced Fare Card	0.7	Never	2.0
2,001–3.000	26.5				
>3,000	21.8				

Table 4. Composition of the focus groups (f=female).

	Focus group 1 (Employer 4)	Focus group 2 (Employer 5)
Participants (f)	8(2)	6(4)
Management	1	2
Employees	7	4

direct public transport connection between the home and work locations, the bus journey takes significantly longer than the same journey by car. Further, 66.4% of employees commute more than 15 km to their workplaces, and only 11.1% of employees live within 5 km of their employers. This is especially relevant for mobility measures that foster walking or cycling to and from work as distance is a main determinant for the usability of these transport modes.

Against this background, it becomes clear that employers in rural areas face different challenges in supporting sustainable mobility than employers in urban regions. The following section discusses if and how employers can play an active role in engaging in sustainable mobility in rural areas.

5. Results and discussions

In the relevant literature, numerous mobility measures and best-practice examples on how employers can support sustainable mobility among their employees have been discussed (Dickinson et al., 2003; Heinen et al., 2008; Heinonen & Weber, 1998; Hamer, Kroes, & Van Ooststroom, 1991; Nash & Sansom, 2001; Root, 2001; OECD, 2002; Van Malderen et al., 2012; Vanoutrive, Van Malderen, Jourquin, Thomas,, Verhetsel, & Witlox, 2009b; Vanoutrive, Van Malderen, Jourquin, Thomas, Verhetsel, & Witlox, 2009a; Vanoutrive et al., 2010; Vanoutrive et al., 2012). These measures can be categorized as follows:

- Encouraging active modes (cycling, walking)
- Encouraging public transport usage (e.g., provision of subsidized public transport tickets)
- Changes in the arrangement of work schedule and work location (e.g., teleworking)
- Investments in infrastructures and services (e.g., bike-sheds; prioritized parking for those who car-pool; provision of shuttle bus services)
- Provision of information

The benefits accruing from the implementation of employer-driven measures encouraging sustainable mobility can take various forms and range from quantifiable financial to more vague benefits. Banister & Gallent (1999) and Newson (1997) suggested that the benefits include reputation improvements, improved accessibility, reduced costs for employers (e.g., due a reduced demand for employer-provided parking), improved relations to their surrounding neighborhood, and positive effects on health and motivation of employees, translating into higher productivity. However, so far research on employer-driven mobility measures has mainly focused on urban areas. In fact, one can expect that most of the measures listed above are much less effective in rural areas. The dispersed nature of settlements, the accompanying long commuting distances, high car ownership rates, and a lack of competitive public transport connections render the switch to alternative modes of transportation difficult.

The surveys, interviews, and focus groups conducted for this study confirm this picture: from the employees' perspective, alternatives to single-occupied car usage for commuting purposes tend to be seen as inferior (Table 4). For instance, our study showed that most employees assess public-transport-oriented measures negatively, mainly due to a perceived lack of convenience, flexibility, and the substantially longer travel times associated with public transport. Also the feasibility of car-pooling initiatives was doubted by employees. These doubts were mostly fed by flexible work–time arrangements and dispersed settlement structures that lead to high coordination efforts and travel time increases. This is further aggravated by

Table 5. Modal split during commute among the employees in percent.

	Employer					Overall
	1	2	3	4	5	%
Car	94.7 %	80.0 %	91.1 %	94.0 %	98.0 %	93.5 %
Car-pooling	1.8 %	0 %	6.2 %	2.4 %	2.0 %	3.6 %
Public Transport	0 %	0 %	0 %	0 %	0 %	0 %
Cycling	0 %	0 %	2.7 %	2.4 %	0 %	1.6 %
Walking	3.5 %	20 %	0 %	1.2 %	0 %	1.3 %
N	57	5	113	83	51	309

Table 6. Average (self-reported) distance in km by mode choice (f=female).

	Obs.	Av. Distance	Std. Dev.	Min.	Max.
Walking (f)	4(1)	1.33 km	0.58	1 km	2 km
Cycling (f)	6(3)	2.0 km	0.84	0.5 km	3 km
Car-pooling (f)	10(4)	59 km	31.77	16 km	120 km
Car (f)	289(144)	28.38 km	21.81	0.5 km	140 km

Table 7. Self-reported walking time (WT) from home to the closest public transport (PT) stop and distance between home and workplace.

WT to closest PT stop	Bus %	Other modes %	All modes %	Distance between home and work	%
0–2 min	18.45	0.83	19.28	0 - 5 km	11.1
2–5 min	28.37	4.67	33.04	5 - 15 km	22.5
5–10 min	23.42	4.69	28.11	15 - 25 km	22.4
10–15 min	9.36	2.76	12.12	25 - 35 km	12.1
15–20 min	4.41	1.10	5.51	35 - 45 km	12.7
> 20 min	0.83	1.11	1.94	> 45 km	19.2
N = 363	84.84	15.16	100.0	N = 307	100.0

highly individualized travel patterns, among others rooted in social responsibilities (e.g., care duties). Employer-driven measures to support cycling were also critically discussed in the focus groups. Besides the commuting distance itself,[26] employees identified missing infrastructure (e.g., cycling lanes) and long distances between central places (e.g., schools, company sites, municipality centers) as major barriers to switching from motorized mobility to active modes of transportation.

Employers are thus confronted with a lack of interest in, and hence a lack of demand for such measures from employees. Not surprisingly, this makes them in turn also less likely to implement such measures, as confirmed by the participating employers. This is consistent with the finding of Root (2001), who shows that employers are not willing to provide public transport travel vouchers to their employees if the employers consider the public transport system inferior to other forms of mobility. Additionally, the lack of demand for such measures often also implies that in case of implementation, the costs per employee who benefits from them, are higher than they would be if a larger number of employees were beneficiaries (most importantly, due to the presence of fixed costs for the implementation). This is for instance the case for the construction of additional infrastructure (e.g., bike-sheds) or for offering shuttle bus services. Most employers (those participating in this study included) are reluctant to justify substantial expenditures that only accrue to few employees.

The concerns of the employees toward employer-driven measures for stimulating sustainable mobility are thus largely mirrored by employers. In fact, among the cases investigated here, we could not find any incoherence in terms of measures demanded by employees, but not implemented by employers. Instead, both parties showed a high extent of agreement that most employer-driven measures would not be useful to either party: they would be costly to the employer and barely be made use of by employees. Measures that were considered useful by a significant share of employees tended to be outside the scope of influence of single employers (e.g., improvement of the public transport system or investments in bicycle paths).

While employer-driven measures for stimulating sustainable mobility targeted at employees are considered highly cost-inefficient by employers, we find that three out of the five participating employers implemented sustainable mobility measures aimed at customers (bike rental and shuttle bus services, Table 1). These three employers are all active in the service sector, and the only beneficiaries of the sustainable mobility measures are customers. While the shuttle bus service has been installed to close the gap between the local train station and the company site of Employer 5 (active in the retail sector), the bike rental services offered by Employers 2 and 3 (both active in the tourism sector) are mainly supplied for recreational purposes, whereas those offered by Employer 5 are mainly supplied to enhance accessibility (the bicycles installed there are part of a larger bicycle sharing scheme). According to the interviews conducted with employer representatives at Employers 2 and 3, customers generally welcome and make use of these alternative transport modes, while the bicycles provided at the site of Employer 5 were barely ever used. In all three firms, the associated costs are considered mainly marketing expenses by the management. Employer representatives stated that in return they expect to gain a "green" reputation, higher levels of customer satisfaction, a stronger customer loyalty and increased profits.

At the moment, the shuttle bus services at Employer 5 are operated between 9 am–6 pm, which is in fact after and before the shifts of the employees start and end, respectively. However, employer representatives argued that an extension of operating times has been discussed in the past, but due to an expected low utilization rate by employees it would not be economically justifiable. Also with respect to the bike rentals, employees did not show much interest. Bike ownership does not seem to be a significant obstacle for commuting by bike, and most employees would prefer to use their own bike if they commuted by bike. More structural reasons (especially long commuting distances and lack of cycling paths) are much more influential for the mode choice. Overall, the focus groups showed that there was no desire from neither the employers' nor the employees' side to open up these services toward employees by expanding them in scope and operating hours.

Hence, it can be concluded that rural employers as well as employees generally assess the potential benefits arising from employer-driven mobility measures as fairly low. Among the cases analyzed in this study, sustainable mobility measures are only implemented by employers active in the service sector, with the customers being the only beneficiaries. Nevertheless, all employers participating in our study voiced a general interest in implementing sustainable mobility measures, which may be partially due to self-selection into a research project concerned with employer-driven mobility measures. The identified constraints to sustainable mobility measures provided by employers in rural areas may be even stronger and more binding among employers without such an interest. Based on these findings, doubts about the adequacy of employer-driven mobility measures to support sustainable mobility in rural areas can be raised.

Our results suggest that due to the missing economic, political, and geographical pressure, employers in rural environments are not able to efficiently provide sustainable solutions to questions surrounding sustainable mobility. In addition, there seems to be no urgent demand from the perspective of employees to switch their transport modes as long as there are no substantial changes in the legal framework (e.g., eligibility criteria for commuting subsidies), spatial planning (e.g., reforms to counteract the sprawl of settlements), infrastructure (e.g., bike paths), and service quality (e.g., service frequency in the public transport system).

6. Conclusions and policy implications

Mobility in rural areas relies heavily on individual car ownership and car usage. Dispersed settlement structures, long travel distances, a lack of public transport provision, and infrastructure for non-motorized modes render single-occupied car usage attractive and often indispensable. Nevertheless, also rural areas will have to decrease their CO_2 emissions. This holds true espe-

[26] The survey showed that only 11% of employees live less than 5 km away from their work location (see Table 7).

cially for countries with a fairly high share of the population living in rural areas like Austria (44%)[27] in order for the CO_2 emission reduction targets set at the Paris Agreement 2016 to be met. Given that the transport sector is one of the largest sources of CO_2 emissions (for instance, in Burgenland it contributes to 47% of all CO_2 emissions)[28], it will have to undergo a transformation toward more environmentally–friendly modes and mobility patterns.

Various studies have shown that employers can assume an important role in affecting the commuting behavior of employees, and hence also in promoting sustainable transport modes (Dickinson et al., 2003; Enoch & Potter, 2003; Van Malderen et al., 2012; Vanoutrive et al., 2010). The literature suggests a broad variety of employer-driven measures aimed at fostering sustainable mobility, such as subsidized public transport tickets, the provision of bike sheds or shuttle bus services (Dickinson et al., 2003; Heinen, E., van Wee, B., & Maat, 2008; Heinonen & Weber, 1998; Hamer et al., 1991; Nash & Sansom, 2001; Root, 2001; OECD, 2002; Van Malderen et al., 2012; Vanoutrive et al., 2009b, 2009a, 2010, 2012). However, most of these studies have been conducted in the context of urban environments, largely ignoring the potential role of rural employers in promoting sustainable mobility among their employees.

Based on a case study of five employers located in Burgenland (Eastern Austria), we investigate opportunities and obstacles for employer-driven measures to support sustainable mobility in rural environments. We find that the potential role of rural employers in supporting sustainable mobility among their employees is very limited. The defining characteristics of rural areas render employer-driven measures cost-inefficient, also because the employees' demand for such measures is low and hence economies of scale do not apply. Our study further shows that only employers active in the service sector have implemented sustainable mobility measures, but then targeted at customers, mostly with the goal to achieve a "green" reputation, better accessibility, or provide for recreational means of transport. This is an indication that only mobility measures that go beyond employees as the main target group may potentially create sufficiently large benefits to employers in rural areas to warrant the costs associated with these measures.

Our findings suggest that it is inefficient for rural employers to act as a catalyst for change toward sustainable mobility, both from a societal as well as a business perspective. As a consequence, it is also not recommended to force rural employers into this role using legal instruments (e.g., obligatory travel plans, see for instance Roby (2010) and Rye (2002)). Instead, individual travelers should be targeted directly, for instance through a reform of commuting subsidies, or—if cost-efficient—through investments in infrastructure and public transport. Longer-term measures include a reform of spatial planning regulations with the aim to avoid a further dispersion of settlements (Enoch & Potter, 2003; Potter, Rye, & Smith, 1999).

Apart from policies aimed at changing the travel behavior of commuters in rural areas, rapid technological progress toward electric mobility, car-sharing, and autonomous cars is likely to lead to a higher level of sustainability in rural transportation in the medium run. Dütschke, Schneider, & Peters (2013) argued that residents of rural areas are very likely to be early adopters of new technologies, because they tend to be highly dependent on cars, and are fairly insensitive to car operating costs (Dargay, 2002).

Especially electric vehicles are a promising avenue toward reducing CO_2 emissions in rural areas, since they have similar advantages in terms of providing individual flexibility as traditional cars running on fossil fuels. Moreover, due to the higher car usage in rural areas, the currently still higher purchasing price for e-vehicles may be more easily offset by the lower operating costs.[29] An indication of the attractiveness of e-mobility in rural areas is that currently 9 of the 10 districts with the highest share of e-vehicles in Austria are located in rural areas.[30] Clearly, the reduction in CO_2 emissions from e-vehicles depends strongly on how electricity is generated. Burgenland with its more than 220 wind turbines provides optimal conditions for renewable energy production.[31]

Also electric bicycles may play an increasingly relevant role as mode of transport in rural areas. As Table 7 has shown, 33.6% of the surveyed employees live within a distance of 15 km to their workplace. At the moment, cycling is mostly used for distances up to 3 km, yet, e-bikes potentially extend the feasible range for cycling and hence have the potential to increase the share of employees who cycle to work. An increasing demand for cycling may also lead to better infrastructure provision for cyclists, and *vice versa*, creating a virtuous circle (Schoner, 2017).

Forms of shared mobility are likely to become increasingly accessible and convenient in rural areas as well, mainly through processes of digitization (e.g., mobility apps) and, in the longer run, automatization (in particular, self-driving cars). Hence, these processes bear the potential to create and to shape new forms of (shared) mobility that are more compatible with sustaining the environment, if they are adopted by rural residents. In this context, a German study shows that residents of rural areas are generally open for adapting new mobility technologies, i.e., forms of (electric) car sharing (Wappelhorst, Sauer, Hinkeldein, Bocherding, & Glaß, 2014). However, the role of these technologies is likely to remain more marginal than in urban areas, where the potential for ride and car sharing is much larger because of higher population and workplace densities, which lead to substantial spatial and temporal overlaps in the demand for vehicles and trips (Tachet et al., 2017).

Generally, digitization will also further enhance the potential for teleworking, both in urban and rural areas. However, in the sectors investigated in this study (construction, manufacturing, tourism, retail) only a minor share of jobs is suited for

[27] http://ec.europa.eu/eurostat/statistics-explained/images/f/f3/Focus_on_rural_-development_RYB2013-DE.xls, 21.12.2016

[28] http://www.umweltbundesamt.at/fileadmin/site/publikationen/REP0592.pdf, 21.12.2016

[29] In the second half of the 2020ies, e-vehicles are expected to become cheaper than traditional cars with combustion engines. Source: https://about.bnef.com/electric-vehicle-outlook/, 17.8.2017

[30] https://www.klimaaktiv.at/mobilitaet/elektromobilitaet/e-pkw-anteil.html, 22.8.2017

[31] http://www.energieburgenland.at/oekoenergie/windkraft/unternehmen/kurz-portraet.html, 16.8.2017

teleworking; most jobs require on-site presence. Because of the low number of jobs potentially eligible for remote working (mostly administrative and managerial jobs), teleworking is likely to remain on the fringes also in the future, and can hence not be considered a very impactful strategy for reducing CO_2 emissions. This is not only the case for Burgenland, but for many other rural areas with a similar economic structure.

Rural areas require special attention to make new forms of sustainable mobility attractive to commuters. Questions regarding the quality of rural power supply and charging infrastructures, as well as the general aim to increase the convenience of electric cars, should be at the center of discussions surrounding rural mobility (Aultman-Hall, Sears, Dowds, & Hines, 2012). Newman, D., Wells, P., Donovan, C., Nieuwenhuis, P., & Davies (2014) suggested public ownership and investment in e-vehicle facilities with the goal to increase the convenience and affordability of e-mobility. For private mobility providers (e.g., fleet owners of autonomous cars), offering their services in rural areas may not be profitable, implying that such services, which may potentially complement public transport infrastructure, may have to be subsidized by the public sector.

The specific politico-economic environment discussed in this study and the potential self-selection biases with respect to the firms under investigation may limit the generalizability of the results presented. Nevertheless, the investigated region (Burgenland) is quite representative for rural areas in industrialized countries, most of which have in common dispersed settlement structures, high rates of car ownership and usage, the accompanying phenomenon of long commuting distances, and a limited public transport availability.

Funding

Bundesministerium für Land- und Forstwirtschaft, Umwelt und Wasserwirtschaft (GZ BMLFUW-UW.1.4.20/0058-V/5/2012); European Regional Development Fund (Cross-border co-operation program AT-HU 07-13, ATMOS/L00154).

References

Aultman-Hall, L., Sears, J., Dowds, J., & Hines, P. (2012). Travel demand and charging capacity for electric vehicles in rural states. *Transportation Research Record: Journal of the Transportation Research Board*, 2287, 27–36.

Banister, C. & Gallent, N. (1999). Sustainable commuting: A contradiction in terms? *Regional studies*, 33(3), 274–280.

Baruch, Y. & Holtom, B. C. (2008). Survey response rate levels and trends in organizational research. *Human Relations*, 61(8), 1139–1160.

Baxter, P. & Jack, S. (2008). Qualitative case study methodology: Study design and implementation for novice researchers. *The Qualitative Report*, 13(4), 544–559.

Becker, H. S. (2008). *Tricks of the trade: How to think about your research while you're doing it*. Chicago: University of Chicago Press.

Braun, V. & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, 3, 77–101.

Creswell, J. W., Hanson, W. E., Plano, V. L. C., & Morales, A. (2007). Qualitative research designs selection and implementation. *The Counseling Psychologist*, 35(2), 236–264.

Curtis, C. (2008). Planning for sustainable accessibility: The implementation challenge. *Transport Policy*, 15(2), 104–112.

Curtis, S., Gesler, W., Smith, G., & Washburn, S. (2000). Approaches to sampling and case selection in qualitative research: Examples in the geography of health. *Social Science & Medicine*, 50(7), 1001–1014.

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.

Dickinson, J. E., Kingham, S., Copsey, S., & Hougie, D. J. (2003). Employer travel plans, cycling and gender: Will travel plan measures improve the outlook for cycling to work in the UK? *Transportation Research Part D: Transport and Environment*, 8(1), 53–67.

Dütschke, E., Schneider, U., & Peters, A. (2013). Who will use electric vehicles? *Working Paper Sustainability and Innovation*, (06).

Eisenhardt, K. M. (1989). Building theories from case study research. *Academy of Management Review*, 14(4), 532–550.

Enoch, M. & Potter, S. (2003). Encouraging the commercial sector to help employees to change their travel behaviour. *Transport Policy*, 10(1), 51–58.

Flyvbjerg, B. (2006). Five misunderstandings about case-study research. *Qualitative Inquiry*, 12(2), 219–245.

Fol, S., Dupuy, G., & Coutard, O. (2007). Transport Policy and the Car Divide in the UK, the US and France: Beyond the Environmental Debate. *International Journal of Urban and Regional Research*, 31(4), 802–818.

Greene, D. L. & Wegener, M. (1997). Sustainable transport. *Journal of Transport Geography*, 5(3), 177–190.

Hamer, R., Kroes, E., & Van Ooststroom, H. (1991). Teleworking in the Netherlands: An evaluation of changes in travel behaviour. *Transportation*, 18(4), 365–382.

Hanson, T. R. & Hildebrand, E. D. (2011). Can rural older drivers meet their needs without a car? Stated adaptation responses from a GPS travel diary survey. *Transportation*, 38(6), 975–992.

Heinen, E., van Wee, B., & Maat, K. (2008). Het effect van werk gerelateerde aspecten op fietsgebruik voor Woon-Werkverkeer. *Proceedings of Colloqium Vervoersplanologisch Speurwerk (CVS)*.

Heinonen, S. & Weber, M. (1998). Recent experience with teleworking: Effects on transport. Technical report, Institute of Technology, Seville.

Hickman, R., Hall, P., & Banister, D. (2013). Planning more for sustainable mobility. *Journal of Transport Geography*, 33, 210–219.

Hsieh, H.-F. & Shannon, S. E. (2005). Three approaches to qualitative content analysis. *Qualitative Health Research*, 15(9), 1277–1288.

Hull, A. (2008). Policy integration: What will it take to achieve more sustainable transport solutions in cities? *Transport Policy*, 15(2), 94–103.

Kohn, L. T. (1997). *Methods in case study analysis*. Center for Studying Health System Change, Washington, lit edition.

Litman, T. (2007). Developing indicators for comprehensive and sustainable transport planning. *Transportation Research Record: Journal of the Transportation Research Board*, (2017), 10–15.

Mattioli, G. (2014). Where Sustainable Transport and Social Exclusion Meet: Households Without Cars and Car Dependence in Great Britain. *Journal of Environmental Policy & Planning*, 16(3), 379–400.

Nash, C. & Sansom, T. (2001). Pricing European transport systems: recent developments and evidence from case studies. *Journal of Transport Economics and Policy (JTEP)*, 35(3), 363–380.

Newman, D., Wells, P., Donovan, C., Nieuwenhuis, P., & Davies, H. (2014). Urban, sub-urban or rural: where is the best place for electric vehicles? *International Journal of Automotive Technology and Management*, 14(3/4), 306–323.

Newson, C. (1997). *Changing journeys to work: an employers' guide to green commuter plans*. Transport 2000.

OECD (2002). Road Travel Demand.

Osti, G. (2010). Mobility demands and participation in remote rural areas. *Sociologia Ruralis*, 50(3), 296–310.

Pettigrew, A. M. (1990). Longitudinal field research on change: Theory and practice. *Organizatio n Science*, 1(3), 267–292.

Potter, S., Rye, T., & Smith, M. (1999). Tax and green transport plans: A survey of UK experience. *Transport Policy*, 6(4), 197–205.

Pucher, J. & Renne, J. L. (2005). Rural mobility and mode choice: Evidence from the 2001 National Household Travel Survey. *Transportation*, 32 (2), 165–186.

Ragin, C. C. & Becker, H. S. (1992). *What is a case?: Exploring the Foundations of Social Inquiry*. Cambridge: Cambridge university press.

Roby, H. (2010). Workplace travel plans: Past, present and future. *Journal of Transport Geography*, 18(1), 23–30.

Root, A. (2001). Can travel vouchers encourage more sustainable travel? *Transport Policy*, 8(2), 107–114.

Rye, T. (2002). Travel plans: Do they work? *Transport Policy*, 9(4), 287–298.

Schoner, J. (2017). *Mutually Reinforcing Relationships Between Bicycling Infrastructure*. PhD thesis, University of Minnesota.

Seawright, J. & Gerring, J. (2008). Case selection techniques in case study research: A menu of qualitative and quantitative options. *Political Research Quarterly*, 61(2), 294–308.

Shergold, I., Parkhurst, G., & Musselwhite, C. (2012). Rural car dependence: an emerging barrier to community activity for older people. *Transportation Planning and Technology*, 35(1), 69–85.

Stake, R. E. (2000). The case study methodology in social inquiry. *Case study method*. London: Sage.

Steuerreform Kommission (2014). Bericht der Steuerreform—Kommission 2014. Technical report.

Su, Q. & Desalvo, J. (2008). The effect of transportation subsidies on urban sprawl. *Journal of Regional Science*, 48(3), 567–594.

Tachet, R., Sagarra, O., Santi, P., Resta, G., Szell, M., Strogatz, S., & Ratti, C. (2017). Scaling law of urban ride sharing. *Scientific Reports*, 7, 1–6.

Umweltdachverband (2014). Abbau umweltschädlicher Subventionen in Österreich. Technical Report September.

Unbehaun, W., Uhlmann, T., Hader, T., Aschauer, F., & Gerike, R. (2014). Care, mobility, employment: How do people in rural areas manage this challenge of squaring the circle. *Proceedings of the Transport Research Arena (TRA)*.

Van Malderen, L., Jourquin, B., Thomas, I., Vanoutrive, T., Verhetsel, A., & Witlox, F. (2012). On the mobility policies of companies: What are the good practices? The Belgian case. *Transport Policy*, 21, 10–19.

Vanoutrive, T., Van De Vijver, E., Van Malderen, L., Jourquin, B., Thomas, I., Verhetsel, A., & Witlox, F. (2012). What determines carpooling to workplaces in Belgium: location, organisation, or promotion? *Journal of Transport Geography*, 22, 77–86.

Vanoutrive, T., Van Malderen, L., Jourquin, B., Thomas, I., Verhetsel, A., & Witlox, F. (2009a). Carpooling and employers: A multilevel modelling approach. In *3rd Transport Research Day*, pp. 335–349. VUB Press.

Vanoutrive, T., Van Malderen, L., Jourquin, B., Thomas, I., Verhetsel, A., & Witlox, F. (2009b). Let the business cycle A spatial multilevel analysis of cycling to work. *Belgeo. Revue belge de géographie*, (2), 217–232.

Vanoutrive, T., Van Malderen, L., Jourquin, B., Thomas, I., Verhetsel, A., & Witlox, F. (2010). Mobility management measures by employers: Overview and exploratory analysis for Belgium. *European Journal of Transport and Infrastructure Research*, 10(2), 121–141.

Verhoef, E., Ubbels, B., Rodenburg, C., & Nijkamp, P. (2001). Sustainable mobility. *Research Memorandum*, 14, 1–6.

Wappelhorst, S., Sauer, M., Hinkeldein, D., Bocherding, A., & Glaß, T. (2014). Potential of Electric Carsharing in Urban and Rural Areas. *Transportation Research Procedia*, 4, 374–386.

Wrede, M. (2014). Agglomeration, tax competition, and fiscal equalization. *International Tax and Public Finance*, 21(6), 1012–1027.

Yin, R. K. (2003). Case Study Research: Design and Methods. Vol. 5. Thousand Oaks, London, New Delhi:SAGE Publications.