Cooperative car sharing in small cities and scarcely populated rural area - an experiment in Austria

Workshop 7. Innovative Finance for Innovative Public Transport

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ABSTRACT

Public transport in small cities and rural areas is typically scarce and limited to the daytime. Austria is not an exception, while a grass-root cooperative car-sharing has evolved as a potential alternative to the public transport in such areas, substituting and/or complementing the scarce public transport. The authors carried out several surveys for a better understanding of grass-root car-sharing and further analyses, including fact-findings, focus-group interviews and a web-based questionnaire to the system developers, organizers and actual users. In this paper, we explain how such grass-root car-sharing works both in small cities and rural areas, and then we present our analyses onto the relationship between public transport and the grass-root car-sharing in rural areas. The role of car-sharing changes in relation to public transport services: in areas with very scarce public transport, the car-sharing car rather substitutes public transport offers, whereas in areas with a small offer in public transport, the car-sharing car can rather complement public transport in low demand times (e.g. during the night). Through combining public transport and car-sharing, users are able to save a second or third car in the household. By offering grass-root car-sharing, municipalities as organizers can also save some fixed costs.

1. Introduction

Providing public transport to meet the various travel needs of the population in rural and remote areas as well as in small cities is becoming more challenging. On one hand, travel needs of the population tend to vary more while on the other hand it is not appropriate to provide a frequent public transport service due to the small number of passengers and the

constraints on public financing except for services that are meeting the needs of non car driver groups such as elderly people and schoolchildren.

Transport on demand has been long sought to fulfill such gap between needs and feasibility. Indeed, in Austria, on which this paper focuses, there are several on-demand bus services in rural areas. As a further alternative, grass-root car-sharing is appearing in rural and remote areas in the recent years. It is a form of car-sharing that can be used in small cities and rural areas, where car-sharing seems to be somewhat unrealistic, while yet a number of important aspects have not been revealed such as how the system operates, customers/user, travel purpose etc. Furthermore, as it appears a functioning car-sharing in rural and remote areas, it may have a good potential to substitute scarce public transport in such area while it has not yet been sought nor discussed yet.

In the research framework presented in this paper, as a basic step to capture an overview, which is a part of a European project *COMPASS*, we carried out several surveys to understand how the grass-root cooperative car-sharing operates, to understand the users' motivation and to discuss the future potential of such systems.

On the course of the research, we combined different methods including fact-finding research, focus-group interviews and a web-based questionnaire. We started with a fact-finding research based on literature followed by fact-finding missions to the system developer and to actual user groups. In addition, we carried out four focus-group interviews to actual users and a web-based survey to capture the actual usages of the shared cars. The web-based questionnaire surveyed grass-root car-sharing users as well as peer-to-peer car-sharing users for comparison.

Furthermore, as the system has a large potential to complement public transport in rural areas, an analysis of the link between grass-root cooperative car-sharing and public transport in remote rural areas will shed some light on this mainly unexplored topic.

In order to give a picture of grass-root car-sharing first, as result of the fact-finding research we present an overview of private car-sharing (Section 2). Then, the survey methods are briefly described (Section 3) and in Section 4 the relevant findings are summarized. An analysis of the relationship between the grass-root cooperative car-sharing and the public transport is carried out and presented in Section 5 and an analysis of the financial aspects is carried out in Section 6. Section 7 concludes this paper.

2. Private car-sharing in Austria

2.1 Overview of car-sharing in Austria

Car-sharing in Austria in general has relatively long history starting 1997; however, as is often the case, the service is limited to the large cities including Vienna, Graz, Linz and Salzburg with more than 10,000 customers nationwide according to the provider (Zipcar Austria GmbH, n.d.). In addition to such conventional car-sharing with fixed stations, free-floating car-sharing is offered in Vienna since 2011 (Daimler AG, n.d.). Thus, in large cities,

car-sharing in Austria can be said well established, while in the rural area, as is the case in other countries, it is not a common mean of transport.

In Austria, “private car-sharing” is becoming popular among the population in the recent years. This concept of private car-sharing includes so-called peer-to-peer car-sharing (European Commission, 2013) and also the grass-root cooperative car-sharing (Caruso Carsharing GesbR, 2013) on which we focus in this paper. At the moment, there are three major private car-sharing providers. Two of them offer peer-to-peer car-sharing while the other offers a platform for the grass-root cooperative car-sharing.

2.2 Grass-root cooperative car-sharing

Grass-root cooperative car-sharing is currently in an experimental phase with a project name CARUSO and the project is supported by Austrian Federal Ministry for Transport, Innovation and Technology. In this section, we briefly summarize the result of our initial fact-finding research with literature (Caruso Carsharing GesbR, 2013) and an interview to the system provider to give an overview of the system before showing the detailed results.

The grass-root cooperative car-sharing is different from the peer-to-peer car-sharing in that the users have to form a group to share one or more car(s) and the shared car is exclusive among the group members. In other words, even if a person is a member of one group, he/she cannot use the vehicle shared by another group although both groups use the same grass-root cooperative car-sharing platform. Peer-to-peer car-sharing is typically an “open” system that the owners and users who are registered to the platform can theoretically use any vehicle within the system, while grass-root cooperative car-sharing is a “closed” system in that the owner-user combination is limited within the group. There are three stakeholders involved in this structure as shown in Table 1.

Table 1. Stakeholders involved in grass-root cooperative car-sharing

Stakeholders	**System Provider**	**Group Organizer**	**Ordinary Users**
Roles	Provision of: • On-board system • Reservation system • Drive Log • Insurance	• Procurement of shared car(s) • Contract management • Accounting • Usage of shared car • Payment of user fee	• Usage of shared car that belongs to the group • Payment of user fee
Who can be?	System-developer	Private person, municipal office, company, association, etc.	Any who is admitted to be a member

The system provider offers a platform which consists of a booking system via the Internet to be used as the user interface and a smartphone app to be installed in the shared car to record the location of the car. It has to be noted that a smartphone app as a user interface is under development at the time of writing this paper as well as a non-smartphone onboard system. An additional insurance dedicated for CARUSO car-sharing car is supplied by a regional insurance company and provided to the groups by the organizer.

The group organizer takes care of the group including contract management, accounting and so on. The organizer is typically also a user of the shared car.

The ordinary user books the car via the web browser. Through the booking process, users are shown a timetable showing the availability of cars that belong to the group. The booking is completed with a few mouse clicks and is a fairly easy process. The booking can be made for 30-minutes unit. If an electric vehicle (EV) is shared, the battery level of the shared car is shown in the booking system. At the booking system, there is a “note” box where user can add any information such as offering a ride share.

The smartphone installed in the shared car serves as a “box” to record the usage and the driven distance with GPS (the GPS data comes from the smartphone) to be transmitted via the cellular data network to the platform’s server and, if EV is shared, to record and transmit the battery level to be shown on the booking website. Recently, instead of this onboard smartphone, a dedicated “CARUSO box” was developed with the same function.

The vehicle’s key is typically stored in a safe box near the parking and the users can take it with a PIN-code, while different arrangement is also possible.

The tariff structure varies in each group as CARUSO platform does not provide “standard” tariff. Some adopts the kilometer-based tariff possibly with annual/seasonal membership fee. One group we interviewed charges only a seasonal (6-month) membership fee while the amount of the fee will be decided through a meeting of the users in the group. In this group, the principle is that the more the user drives, the more he/she pays, while the amount is roughly decided through the negotiation. Similarly the payment system (e.g. bank transfer or cash) differs among the groups and is determined according to the needs of the group.

Ownership of the vehicle varies among the groups. One typical arrangement is that a municipality owns its official vehicle and it is served as a car-sharing car. Another case we found is that the users form a cooperative and it owns several vehicles to be shared. In another case, a user in a group owns a car privately and it is shared among the group members.

3. Surveys

As briefly mentioned in the Section 1 (Introduction), we carried out several surveys with different methods. The survey was targeted to the municipalities of Gaubitsch, Thüringerberg, Langenegg (all of these three are rural municipalities that organize the grass-root car-sharing) and Bregenz (a privately-organized case exists). Among the number of groups using the car-sharing platform, according to the platform manager, these four places are where the system works the best at the moment. Table 2 gives a short overview of the surveyed car-sharing groups in Austria.

Table 2. Overview of the municipalities of the car-sharing groups surveyed in this research

Group	Gaubitsch	Thüringerberg	Langenegg	Bregenz
Federal state	Lower Austria	Vorarlberg	Vorarlberg	Vorarlberg
Inhabitants*	892	671	1,064	28,007
Area [km^2]	22.47	10.39	10.47	29.47
Pop. density [Pers/km^2]	40.4	66.2	105.6	940.5

Source: Websites of each municipality (Gemeinde Gaubitsch, 2013; Gemeinde Langenegg, 2012; Gemeinde Thüringerberg, 2013; Stadt Bregenz, 2013)

Figure 1. Locations of the surveyed groups / municipalities

Table 3. Overview of the car-sharing groups surveyed in this research

Group	Gaubitsch	Thüringerberg	Langenegg	Bregenz
Initiative	Municipality	Municipality and Biosphere Park Office (adjacent to town hall)	Municipality	Private
No. of Users	29 group members, 12 – 15 active users per month	12 group members, all are active users	30 group members, some are inactive users	29 group members, 15 active users per month
No. of cars shared	1 EV	1 EV	1 conventional car	1 EV, 3 conventional cars
Tariff	99 € annual membership fee, 10 Cent/km.	The first half-day is for free, every following half day costs 15 Euro; members negotiate twice a year their monthly monetary contribution according to the expected amount of usage.	No basic/member fee; Prices based on driven km (no time units); 28 Cent/km + up to 15 Cent/km extra charge for first 15km.	10 € yearly membership fee; 3 € per booking; 36 Cent/km (fair use: for a longer use – 3 km/hour are assumed and accounted).

3.1 Focus-group user interviews

We carried out four focus-group interviews to the user groups in one small city and in three rural villages in Austria (See Table 2).

Three of the authors of this paper participated in the interview. An overview of the interviews is shown in Table 4. Each interview lasted between 1 hour and 40 minutes (Thüringerberg, Langenegg and Bregenz) and 2 hour 30 minutes (Gaubitsch) and among 3 to 8 grass-root car-sharing users participated. As none of them has a group name, we call each group with the names of the municipalities where the car-sharing groups are located.

Table 4. Overview of the car-sharing groups surveyed in this research

Group	Gaubitsch	Thüringerberg	Langenegg	Bregenz
Interview date & time	28.01.2013 6 p.m. – 8:30 p.m.	13.02.2013 6 p.m. – 8 p.m.	14.02.2013 1 p.m. – 3 p.m.	12.02.2013 5 p.m. – 7 p.m.
Interview place	At the municipal office in Gaubitsch	At the office of the biosphere park in Thüringerberg	At the municipal office in Langenegg	At the housing complex where many CARUSO users live in.
Focus-group participants	8 users (1 woman, 7 men)	3 users (3 women)	6 users (2 men, 4 women)	6 (3 men, 3 women)

3.2 Web-based user survey

Web-based survey was carried out by distributing the web-link to the online questionnaire. The distribution was done via the group leaders of the aforementioned four groups so that the questionnaire reaches to the respondents more in a visible manner. We collected 17 valid answers.

3.3 Interview to the organizers

In addition to the user surveys, we carried out interviews to the organizers. As the organizer is often present at the focus-group user interview, the interview is partly carried out as a part of it, while we also carried out an interview over the telephone to obtain further detailed information.

3.4 Web-based literature survey

Moreover, we carried out a web-based literature survey to obtain detailed information about the running public transport in the surveyed regions.

4. Organization and usages of shared cars

In this section, utilizing the results from the aforementioned surveys, the organization and usage are briefly summarized to provide a base for the further discussion. This section is subdivided into a section for rural areas and section for a small city.

4.1 Semi-publicly organized grass-root cooperative car-sharing in rural areas

In the three rural or remote groups we surveyed, namely Gaubitsch, Thüringerberg and Langenegg, each municipality provides one car-sharing vehicle. All cars are owned by or leased to the municipality and offered as a car-sharing car as well as used as their official cars. The municipality thus launches the initiative to set up the grass-root car-sharing.

The typical motivation for the municipality to offer the shared car is to reduce the cost of the official cars. On one hand, through the car-sharing initiative, municipalities can have some income to cover the maintenance cost of the car. On the other hand, typical motivations for the car-sharers are curiosity for the EV or the provided new system, to substitute/save a second or third car in the household, or even to substitute a main car becoming old or unaffordable. Most of the users live within the municipality and thus they tend to know each other in advance – this serves as an advantage to form a group to share a car.

In all three surveyed groups the car-sharing car is located in front of the centrally-located municipal office. If a reservation period starts immediately after the previous one, the car is either handed over directly from one user to another, or people get together where the car is parked to hand over the car. In both cases people meet and it stimulates communications among them.

As mentioned before, pricing models are different among the groups, while they are set in a transparent way often raising the awareness for the costs of driving a car in general. Sharing a car with other people also seems to raise the consciousness for the own driving behavior, having the possibility of adapting a car to the needed purpose (e.g. carrying heavy luggage).

The car-sharing vehicle is both used for official use (e.g. business travels of municipality employees and even mayor’s business trips) as well as for private uses of the car-sharers. The use by the municipality is limited to the business trips while the other members use it mainly for private purposes such as shopping or visiting doctors, friends, carrying heavy goods etc. Some shopkeepers make the most of the special vehicle type (a van) shared on the platform to deliver the goods to the customers.

4.2 Privately organized grass-root cooperative car-sharing in small cities

The group we surveyed is located in a housing complex of 12 households in Bregenz. The group founded an association to purchase and own two cars to be shared within this housing complex. In addition, two car owners in the group offered their cars to be shared using the platform. Thus, the members of this group have four options ranging from a small EV and a 2-seater to larger sedans.

The motivations according to the users are again curiosity for the EV or for the new system, to use a car only for specific purpose such as to carry heavy luggage, to substitute an own car becoming old, and so on.

The usage is mainly for private purposes and mostly for the case where the public transport does not provide a service matching the travel needs. Sometimes the car is used for longer period to go to the airport for pick-up/drop-off, to go to neighboring countries, and so on.

4.3. Trips carried out with grass-root car-sharing

During the web-based user survey, we asked the respondents to recall two last usages of the shared cars and to provide the information about the trips.

As the result in Figure 2 show, the numbers of trips on weekdays predominate, but the weekend trips are also of high importance.

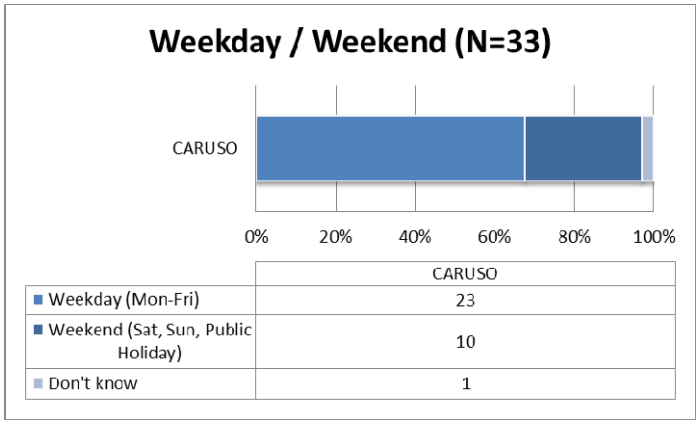


Figure 2. Trips made on weekdays or in the weekend

Time of the day is also reported from the last two usages. More than 70% of the trips are made between 9 a.m. and 17 p.m. Almost 30% of the trips are made in the evening and the night.

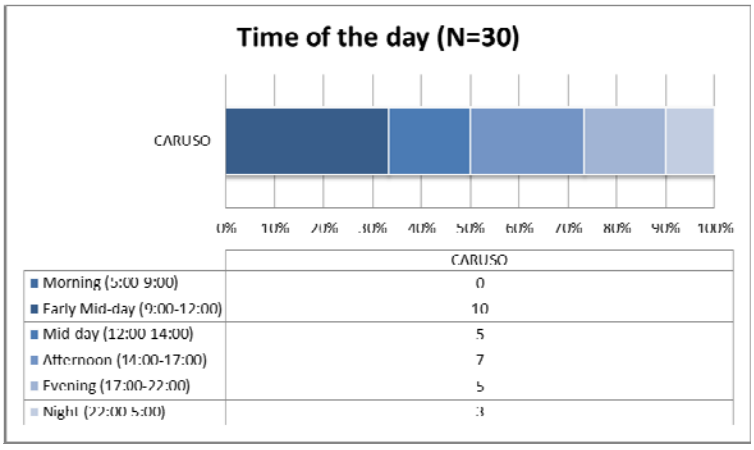
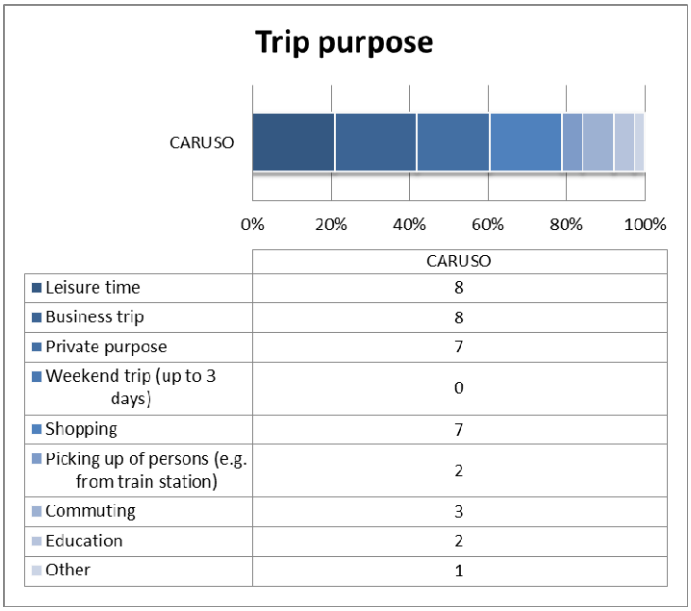


Figure 3. Trips on different times of the day

Figure 4 shows the different trip purposes: the usage is almost equally split to important daily trip purposes including leisure, business, private and shopping. This implies that the car-sharing car is mainly used to fulfil the daily travel needs in remote rural areas, but also for leisure time.



	CARUSO
Leisure time	8
Business trip	8
Private purpose	7
Weekend trip (up to 3 days)	0
Shopping	7
Picking up of persons (e.g. from train station)	2
Commuting	3
Education	2
Other	1

Figure 4. Different trip purposes

The travel distance was also asked in the survey (see Figure 5). The users tend to drive mainly distances up to 40 km, although longer trips with more than 50 km were made too. The users appear to use the car-sharing car for the distance covering daily needs such as to nearby towns.

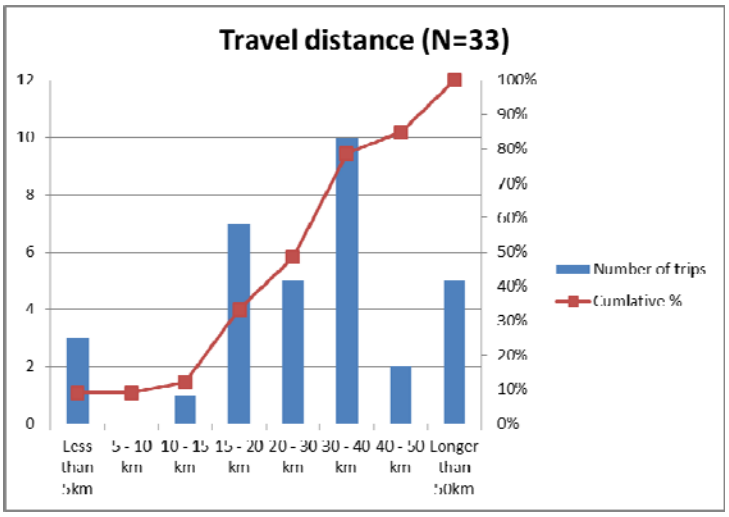


Figure 5. Number of trips and travel distance

In summary, the car-sharing car appears to meet daily needs as it is used mainly on weekdays with short travel distances for purposes such as business trips, shopping or private purposes. Nevertheless the car is also used for leisure purposes and on weekends.

5. Grass-root car-sharing and public transport in rural regions

In this section, a discussion is made regarding the relationship between the semi-publicly organized grass-root car-sharing and the public transport in the rural area. The reason to focus on the rural area is that a somewhat frequent public transport is already provided in the small city where the grass-root car-sharing is in operation and the car-sharing group is privately organized. The rural area's public transport is more challenging given the scarce population and high ownership of the own automobiles. First, we briefly describe the public transport in the surveyed region, and then we summarize our findings about the user's perception.

5.1. Public transport services provided in the surveyed regions

A summary of public transport provided in the surveyed rural areas are shown in Table 5.

Table 5. Public transport in the surveyed municipalities

Location	Gaubitsch	Thüringerberg	Langenegg
Type and lines of PT served	Bus; 3 Regional lines, No Railway.	Bus, 2 Regional lines, No Railway.	Bus, 2 Regional lines, 1 Nightline (Bus), No Railway
Frequency	Altogether every 1-2 hours(s) per direction to the nearby regional center.	1 line: every 1-2 hour(s) per direction on weekdays & weekends to nearby regional transport hub; The other: two buses per direction per day.	1 line hourly per direction on weekdays, every two hours on weekend, the other 3 buses/day only on weekdays. Nightline only on weekends, just one bus per night
Service hours	Morning to early evening (c.a. 18:00)	Daytime only	Morning to early evening (until c.a. 19:30)
Municipality's subsidy to PT operator	None	EUR 40 per inhabitant paid for regional public transport association	EUR 40 per inhabitant paid for regional public transport association
Municipality's subsidy to passengers	None	Citizens can loan an annual ticket owned by the municipality valid for entire region for EUR 3 per day. Young people (<20) are subsidized half of night taxi after PT operating hours.	Two single or two-zone tickets per household every year Subsidy for public transport annual ticket valid for the entire region (only for tariff transition period).

Source: Timetables (Dr. Richard Niederösterreich Verkehrsbetrieb GmbH & Co. KG, 2013; Gemeindeamt Langenegg, 2011; Landbus Walgau, 2012a, b; ÖBB-Postbus GmbH, 2012, 2013), telephone interviews with the group organizers

Among the three rural areas we surveyed, two of them (Gaubitsch, Thüringerberg) has bus services connecting villages and scheduled mainly for the schoolchildren and for the people going for shopping and for other services (e.g. medical services) in regional centers nearby. The other (Langenegg) has, in the daytime, an hourly bus services going to nearby towns where passengers can change to another bus without waiting time to go to the large cities in the region. In case of Langenegg, there used to be much less public transport offered in the past, while the service was extended in the last decade.

In two of them (Thüringerberg and Langenegg), both of which are located in Vorarlberg, municipalities pay annually EUR 40 per inhabitant to the state's public transport association to subsidize the public transport. This public transport association is a governmental body to organize and procure public transport services.

5.2. Users' perception of public transport in relation to car-sharing

During the focus-group interview, we asked the participants with their perception of public transport in relation to car-sharing.

In Gaubitsch, it does not appear an important topic while the users simply perceive that there is scarce public transport, and we did not obtain any further comments. According to the municipality, public transport is not a topic at all in the municipality. It appears that the people's interest in it is fairly low compared to the other surveyed region.

In Thüringerberg, users indicated that they use the shared car often in the evening when public transport is not serving the municipality any more, while they also find the car as a good alternative to public transport with higher flexibility.

In Langenegg, similarly, the users indicated that they use car-sharing car especially on the weekend as well as in the evening, when the public transport becomes scarce to be spontaneous or to transport some goods. It is also mentioned that especially the young people who take public transport during the week for business trips sometimes use the shared car in the weekend to be more flexible. The bus service was made more frequent over the last years and more people own the annual tickets valid for the entire state than before – the municipality indicated that it does not intend to produce a competition between public transport and private car-sharing and thus it does not intend to introduce another car-sharing car although the occupancy would get higher because of this.

6. Financial aspects of grass-root car-sharing

As described in the previous section, the grass-root car-sharing has much potential to substitute or complement public transport in the rural area. A question then arises if it is financially feasible.

As briefly mentioned before, the publicly-organized cars are not only used as the car-sharing vehicle but also as the municipalities' official cars. Municipalities often intend to reduce the fixed cost of the official car by offering it as a car-sharing car. In this section, we first show our survey result about such financial aspects and then discuss the feasibility.

6.1. Financial aspects by municipality

6.1.1 Gaubitsch

Currently slightly more than the half of the car-sharing car's cost is financed by the municipality while the rest is paid by the users. The car has a very high mileage of 21,000 km per year, which brings a certain income for the municipality.

Car-sharing contributes to the municipality in that the fixed cost of the car can be partly covered by the user fee, which the municipality would have to pay fully if it were used as the exclusive official car. In total, the municipality reduces its expenses related to its business travels by approximately 2,500 € every year compared to owning its exclusive official car.

In addition to this cost-saving, the municipality enjoys various advantages such as good publicity, CO_2 reductions (estimated to be 2.8 t/year) and interests by other municipalities. Furthermore, as the shared car is in a framework of a financial leasing that the car will be an asset of the municipality at the end of the leasing period, the car-sharing can secure such asset acquisition.

6.1.2 Thüringerberg

Slightly more than the half of the car-sharing car's cost is financed by the municipality and the biosphere park together while slightly less than the half is financed through the user fee at the moment.

However, the car-sharing car does not appear to contribute directly to the cost-savings for the municipality. The car is rarely used by municipal employees as the official car while it is mainly used by private users and as the official car of the biosphere park. Thus, although the cost incurred through the shared car for the municipality is lower than the cost which would be incurred for an exclusive official car, the municipality is considering restructuring the pricing model so that each user can bear the cost more proportionally.

As the municipality is selected as a model region for electric mobility which is called VLOTTE, it can lease the EV to be shared for lower expense due to the subsidy in the model region.

6.1.3 Langenegg

Langenegg has two different phases of car-sharing; the first one was from 2002 to 2011 when only one car which is named "Fifty" used both by the municipality as its only official car and by the citizens as car-sharing users without any Internet-based reservation system. In the second phase since 2011, the "Fifty" is mainly shared by the private users while municipality still uses it as its second official car. Another EV is used as the municipality's main official car.

In the first phase, the annual cost savings for the municipality was approximately 2,000 € per year which corresponds to the travel expenses. The financing of the "Fifty" was at that time 60% by the municipality and 40% by the users.

In the second phase, the cost savings for the municipality is limited and it depends on the kilometers driven. Car-sharing becomes cost-covering with 15,000 km driven per year. Currently the “Fifty” is driven between 17,000 and 18,000 km per year and thus it is contributing to it. The financing of the “Fifty” is 20% by the municipality (they are also paying the km for the voluntary workers who use the car) and 80% by the users, and the EV is of course 100% financed by the municipality. However, the municipality is still satisfied with it as the cost-savings is not a main goal of the car-sharing in the municipality, while the main goal is to reduce the second cars.

7. Conclusions and future research perspective

As described in this paper, the grass-root cooperative car-sharing appears to work well in various ways, especially when organized by a small municipality as a semi-public one or when organized privately in cities. In the cities, the system’s advantage seems better utilized when it is organized privately, while in rural areas, the one organized by municipality appears to be well working. One of the keys for successful organization appears to be the easy-to-handle reservation system on the Internet that is acceptable by various generations. However, more importantly, the closeness of the users has to be accounted in that almost everyone in each group knows each other before starting car-sharing.

“Savings” is one of the main benefits of such grass-root car-sharing in the rural area while it appears in different ways for the different stakeholders. From users’ point of view, saving a second and/or a third car is possible and thus it contributes to monetary saving related to such cars in the household while maintaining the flexibility that they cannot have without cars in the rural regions. If there is a considerable public transport offered in a region, the grass-root car-sharing appears to be able to save even the main car if the household is small.

From the organizer’s / municipalities’ point of view, cost savings for the official car is one of the most important factors, while there is also a potential for saving the expensive cost related to public transport for time in which it is not used such as night and weekends. However, the grass-root car-sharing alone does not seem to be able to replace public transport fully while it rather seems to have a potential to substitute or complement public transport in such low-demand times. It has to be noted that the complete replacement seems very costly for the municipality and thus not realistic because they would need more shared cars.

Further benefit appears in relation to the social networks as the formation of the group can “connect” the people through the car-sharing. In addition, the grass-root cooperative car-sharing can give the people an opportunity for demand-oriented thinking of their mobility and thus eventually raise the awareness of the optimal mode choice according to the demand. However, it appears that this happens only if there is a usable public transport at least during the daytime; otherwise, as discussed before, the grass-root car-sharing does not work as a complementary offer to the public transport and thus such opportunity has to be limited.

So far, as this application of car-sharing is still small-scale and only made in Austria at the moment and so did our research, further issues has to be researched such as transferability to other places and unrecognized preconditions to make it improperly organized. However, at

large, considering that the financial resource that each municipality can spend on public transport will tend to be limited in the future and the aging of the population continues rapidly especially in the rural areas, which may eventually lead to the increase of the people who cannot afford a car, the semi-publicly organized grass-root car-sharing can have a great potential as an alternative to the public transport during the time when the demand for public transport is low.

References

Caruso Carsharing GesbR (2013). "FAQ - Häufig gestellte Fragen." Retrieved July 10, 2013, from http://carusocarsharing.com/faq/.

Daimler AG (n.d.). "Vienna Calling: 500 smart für car2go Wien." Retrieved July 10, 2013, from http://www.smart.at/smart-welt-news-news-aktuelles-car2go/8790a6d0-5b5d-5dda-80ca-c22633378675.

Dr. Richard Niederösterreich Verkehrsbetrieb GmbH & Co. KG, 2013. Fahrplan 7553 Laa an der Thaya - Mistelbach.

European Commission (2013). "carsharing24/7 – the platform for peer-to-peer Carsharing." Retrieved July 10, 2013, from http://world-you-like.europa.eu/en/success-stories/project-overview/carsharing247-the-platform-for-peer-to-peer-carsharing/.

Gemeinde Gaubitsch (2013). "Zahlen & Fakten." Retrieved July 10, 2013, from http://www.gaubitsch.at/system/web/fakten.aspx?menuonr=218470547.

Gemeinde Langenegg (2012). "Zahlen & Fakten." Retrieved July 10, 2013, from http://www.langenegg.at/rundgang/gemeinde/fakten.html.

Gemeinde Thüringerberg (2013). "Zahlen und Fakten." Retrieved July 10, 2013, from http://www.thueringerberg.at/system/web/zusatzseite.aspx?menuonr=222561433&detailonr=222561422.

Gemeindeamt Langenegg, 2011. Langenegger Busfahrplan.

Landbus Walgau, 2012a. Fahrplan Linie 75.

Landbus Walgau, 2012b. Fahrplan Linie 77.

ÖBB-Postbus GmbH, 2012. Fahrplan 1206 Mistelbach/Zaya - Zwentendorf / Siebenhirten - Laa/Thaya.

ÖBB-Postbus GmbH, 2013. Fahrplan 1242 Laa/Thaya - Ungerndorf - Hanfthal - Unterstinkenbrunn - Diepolz - Zwingendorf.

Stadt Bregenz (2013). "Zahlen und Fakten." Retrieved July 10, 2013, from http://www.bregenz.gv.at/wirtschaft-zahlen-fakten/zahlen-und-fakten.html.

Zipcar Austria GmbH (n.d.). "Über uns." Retrieved July 10, 2013, from http://www.carsharing.at/de/pub/footer/ueber_uns/ueber_zipcar_austria.htm.