



more options for energy efficient
mobility through Car-Sharing

The State of European Car-Sharing

Final Report D 2.4 Work Package 2

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Bundesverband CarSharing e. V.
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momo Car-Sharing
More options for energy efficient mobility through Car-Sharing

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Table of content

0.	Executive Summary	1
1.	Introduction and overview	5
1.1	The momo Car-Sharing project	5
1.2	Report contents	7
2.	State of Car-Sharing in Europe	9
2.1	Overview	9
2.2	The state of Car-Sharing in European countries	11
2.2.1	Austria	11
2.2.2	Belgium	11
2.2.3	Denmark	12
2.2.4	Finland	13
2.2.5	France	13
2.2.6	Germany	14
2.2.7	Great Britain	14
2.2.8	Ireland	15
2.2.9	Italy	16
2.2.10	The Netherlands	17
2.2.11	Portugal	17
2.2.12	Spain	17
2.2.13	Sweden	17
2.2.14	Switzerland	18
2.3	Comparative estimate of Car-Sharing growth	19
3.	Survey of European Car-Sharing providers	21
3.1	Survey method	21
3.2	Return of the questionnaires	21
3.3	Selected survey results	24
3.3.1	Findings on Car-Sharing use	24
3.3.2	Findings on the collaborative activities of Car-Sharing providers	34
3.3.3	Findings on political support	46

4.	The profile and motivation of Car-Sharing customers	50
4.1	Current private customers	50
4.1.1	Socio-demographic characteristics of Car-Sharing participants	54
4.1.2	Socio-economic categories of today's Car-Sharing participants	54
4.1.3	Reasons for joining Car-Sharing	56
4.1.4	Satisfaction with Car-Sharing provider and service	57
4.2	Current business customers	59
4.3	Selected assessment of potential for future Car-Sharing use	64
5.	Environmental effects of Car-Sharing	69
5.1	Vehicle-related environmental effects	69
5.1.1	Car-Sharing vehicles are appropriate to the purpose of the particular journey	69
5.1.2	Car-Sharing vehicles use less fuel and emit fewer pollutants	70
5.1.3	Alternative drive systems in the fleet	73
5.2	Behaviour-related environmental effects	74
5.2.1	Each Car-Sharing vehicle replaces at least four to eight personal cars	74
5.2.2	Cost transparency reduces kilometres driven	81
5.2.3	Car-Sharing changes driving behaviours	83
5.2.4	Car-Sharing services a cause for environmentally-friendly transport behaviours or only a supportive mobility service?	86
5.2.5	Car-Sharing reduces the CO ₂ burden of transport	86
5.2.6	Voluntary measures: CO ₂ offsetting through the provider or the user	87
5.3	Conclusion: Car-Sharing serves the collective good	88
6.	Success factors of the above-average growth in Car-Sharing use	89
6.1	The influence of collaboration with public transport companies	89
6.1.1	Possible components of "package deals"	89
6.1.2	Car-Sharing is organised by subsidiaries of the public transport operator	91
6.1.3	Example: Collaboration between the Brussels public transport operator (STIB/MIVB) and cambio Brussels	92
6.1.4	Mobility packages: the highest level of a joint offer of integrated sustainable urban mobility	92
6.2	Car-Sharing for business	95

6.3	Collaboration with communities and regions	97
6.3.1	Car-Sharing development strategy of Greater London	98
6.3.2	Car-Sharing Action Plan for Bremen (Germany)	101
6.3.3	Support of local councils in Italian cities	101
6.4	Support programmes at higher political levels	102
6.4.1	Example: Italy	102
6.4.2	The Swiss “climate cent” benefits Car-Sharing	103
6.4.3	State-supported awareness campaigns	104
6.5	Car-Sharing as a cost-efficient service	105
6.6	Modern system technology	106
7.	Constraints to Car-Sharing development	108
7.1	Political constraints	108
7.1.1	Car-Sharing stations in public street space	108
7.1.2	Contradictory political signals caused by short-term thinking and an apparent desire to be seen to be doing something	109
7.1.3	Hidden subsidies of car ownership and driving	110
7.1.4	Faith in technology is stronger than awareness raising about mobility management	111
7.1.5	Integration of Car-Sharing with the “eco-modes” of transport	111
7.2	Economic constraints	111
7.3	Individual constraints	112
7.3.1	Limited or inadequate understanding of Car-Sharing	112
7.3.2	The emotional attachment to the personal car	112
7.3.3	Limited recognition at the national level of the value of the eco-modes of transport	113
7.3.4	Limited or inadequate understanding of the costs of the private automobile	114
7.3.5	Higher fixed costs inhibit willingness to use multi-modal travel	114
8.	Literature	115

List of Figures

Fig. 1.1:	Organisational structure of the momo project	6
Fig. 2.1:	Organisational structure of Belgian Car-Sharing provider	12
Fig. 2.2:	Car-Sharing participants in European countries in relation to total population	19
Fig. 2.3:	The trend of Car-Sharing participation shows both above and below average Car-Sharing growth	20
Fig. 3.1:	Start year of responding Car-Sharing providers	25
Fig. 3.2:	Number of responding Car-Sharing providers by number of users	25
Fig. 3.3:	Specific CO ₂ emission of the Car-Sharing fleet	29
Fig. 3.4:	Specific CO ₂ emission of light-duty vehicles in the Car-Sharing fleet	29
Fig. 3.5:	Spatial distribution of Car-Sharing users in metropolitan areas	31
Fig. 3.6:	Assessment of the collaborative activities with local public transport companies	36
Fig. 3.7:	Assessment of collaborative activities with regional public transport companies	37
Fig. 3.8:	Assessment of collaborative activities with local public transport authorities and regional public transport associations	38
Fig. 3.9:	Assessment of collaborative activities with bicycle providers or bicycle rental companies	39
Fig. 3.10:	Assessment of collaborative activities with local taxi services	40
Fig. 3.11:	Assessment of collaborative activities with car rental companies	42
Fig. 3.12:	Assessment of collaborative activities with car dealerships	43
Fig. 3.13:	Assessment of collaborative activities with car repair shops	44
Fig. 3.14:	Assessment of collaborative activities with car park companies	45
Fig. 3.15:	Assessment of collaborative activities with housing associations	46
Fig. 3.16:	Assessment of national political and legal conditions for a successful Car-Sharing service	47
Fig. 3.17:	Assessment of support through local policy or local administrations	49
Fig. 5.1:	Map of the neighbourhood of Vauban in Freiburg (Germany) with two central car parks and a green area where car-free households have to build a car park if they purchase cars	80
Fig. 5.2:	Distances driven by 520 Car-Sharing households in Switzerland with and without Car-Sharing services	84
Fig. 5.3:	Annual energy use of 520 Car-Sharing households in Switzerland with and without Car-Sharing services	85

Fig. 6.1:	Success curve of Car-Sharing development in Great Britain (London) in the last three years	100
Fig. 6.2:	Cost comparison of the annual costs of a company-owned car versus Car-Sharing use	106

List of Tables

Table 2.1: Car-Sharing customers and vehicles in Europe	10
Table 3.1: Return of completed questionnaires	22
Table 3.2: Representativeness of returned questionnaires using the example of the criterion Car-Sharing vehicles	23
Table 3.3: Authorised users per private customer contract	26
Table 3.4: Authorised users per business customer contract	26
Table 3.5: Proportion of contracts and authorised users – private and business customers	27
Table 3.6: Average number of Car-Sharing vehicles at stations	27
Table 3.7: Car-Sharing vehicles with more environmentally friendly drive technology	28
Table 3.8: Personal vehicles disposed of or not acquired by Car-Sharing customers	32
Table 3.9: Average annual kilometres driven in Car-Sharing vehicles in 2008	32
Table 3.10: Use of Car-Sharing vehicles in 2008 (by time)	33
Table 3.11: Number of bookings by private customers	33
Table 3.12: Annual driving time for private and business customer in 2008	34
Table 3.13: Average vehicle use time in 2008	34
Table 3.14: Collaborative activities with local public transport companies	35
Table 3.15: Collaborative activities with regional public transport companies	36
Table 3.16: Collaborative activities with local public transport authorities or regional public transport associations	37
Table 3.17: Collaborative activities with bicycle providers or bicycle rental companies	39
Table 3.18: Collaborative activities with local taxi service	40
Table 3.19: Collaborative activities with car rental companies	41
Table 3.20: Collaborative activities with car dealerships	42
Table 3.21: Collaborative activities with car repair shops	43
Table 3.22: Collaborative activities with car park companies	44
Table 3.23: Collaborative activities with housing associations	45
Table 4.1: Proportion of men and women among current private customers of various providers	50
Table 4.2: Proportion of various levels of formal education among Car-Sharing customers	51
Table 4.3: Proportion of users or user households without a car	52

Table 4.4: Proportion of users with season tickets (yearly or monthly) for public transport	53
Table 4.5: Socio-economic categories of German Car-Sharing customers in the 2004 Wuppertal Institute study	55
Table 4.6: Most important reasons named by private customers for joining Car-Sharing	56
Table 4.7: Most important media and information channels through which customers are made aware of Car-Sharing services	57
Table 4.8: Customer satisfaction ratings	58
Table 4.9: Breakdown of business customers surveyed by Mobility, Switzerland by sector and authorised users	60
Table 4.10: Comparison of estimates of future potential for the development of Car-Sharing in different European countries	65/66
Table 4.11: Assumptions and findings of Car-Sharing scenarios for Europe from Frost & Sullivan	67/68
Table 5.1: Comparison of the specific CO ₂ emissions of different Car-Sharing fleets with the average personal car in various countries	71/72
Table 5.2: Number of car-free Car-Sharing households before and after joining	74
Table 5.3: Number of new customers without a motor vehicle by year of joining Mobility	75
Table 5.4: Survey results on car ownership in the households of Car-Sharing customers	77/78
Table 5.5: Car-Sharing customers and vehicles in Europe, part 2	81

0. Executive Summary

Comparing Car-Sharing development in Europe

This report is a summary of the development of Car-Sharing in Europe as at the start of the EU project momo Car-Sharing. At the beginning of the project, Car-Sharing services existed to a greater or lesser degree in 14 European countries. At the beginning of 2009, there were approximately 380,000 Car-Sharing participants in Europe, to whom approximately 11,900 Car-Sharing vehicles were available.

At the beginning of this report, brief reports on the state of Car-Sharing in the 14 countries are provided and an overview of the development, provider structure and spatial distribution of the respective services are given. The overview includes a comparative evaluation of the level achieved in the European Car-Sharing countries. It shows that to date only Switzerland has achieved a Car-Sharing participation rate of more than one percent of its population. All other developed Car-Sharing countries in Europe show a participation rate of less than 0.2%; currently Germany, the Netherlands, and Sweden – at one seventh the level of Switzerland – have attracted the highest proportion of their population to Car-Sharing use.

Survey of European Car-Sharing providers

At the beginning of the momo Car-Sharing project, a survey was carried out of all known Car-Sharing operators in Europe. 108 out of 205 Car-Sharing providers who were contacted filled out a questionnaire and took part in the analysis.

In this summary, only selected results of the analysis can be presented. The analysis represents the situation as at the beginning of 2009.

Every contract with a private Car-Sharing customer represents 1.1 authorised drivers. For business customers, it is an average of 3.3 authorised drivers. Based on the number of authorised drivers registered with the respondents, the survey shows that 84 percent of customers are private customers and 16 percent are business customers. The Car-Sharing fleets of the respondents include only four percent of their vehicles having a particularly environmentally-friendly drive system. The average specific CO₂ emissions of the fleets examined is just under 142 g CO₂/km for the larger providers. When the Swiss provider Mobility is excluded, this number goes down to just below 130 g CO₂/km, while emission levels of the fleets of smaller providers are even lower.

One third of private customers live in the centre of their city, a further half in densely-built neighbourhoods surrounding the city centre. 12% of private customers are located in more distant neighbourhoods in which large numbers of social housing units are located. Only 5% of private customers come from those peripheral neighbourhoods that often have larger numbers of tree-filled residential estates with detached single family homes. In principle, a similar spatial distribution occurs among business Car-Sharing users.

Some providers have information on whether their customers disposed of a personal car or put off getting a new one upon becoming Car-Sharing customers. For these providers, a ratio was found among their customers of one Car-Sharing vehicle for seven personal vehicles either disposed of or not purchased.

Each Car-Sharing vehicle is driven an average of just over 23,000 km annually and is in use for at least six hours a day. Each private customer books a Car-Sharing car approximately 15

times per year and drives an average of more than 700 km. In 2008, the average business customer drove 2.5 times more kilometres than this in Car-Sharing vehicles.

One third of all Car-Sharing providers have established agreements with local public transport providers, and two thirds of the larger providers have such agreements. The most common forms of collaboration are lower rates and special deals for regular public transport customers who become Car-Sharing customers, joint advertising and public relations activities that benefit Car-Sharing, shared marketing and shared channels for registering new Car-Sharing customers. This collaboration is rated by Car-Sharing providers as “important.” On the other hand, the state of the collaboration is rated as only average or “satisfactory.” There appears thus to be some need for improvement here.

Collaboration with regional public transport companies or public transport authorities, on the other hand, is not as widespread and, where such collaboration exists, is also rated as rather poor. Collaboration with providers of bicycle services or with taxi companies is also not widespread, whereas almost one third of Car-Sharing providers collaborate with a car rental company. Among the larger providers, this becomes almost every second provider.

The responses regarding policy and legal conditions at the national level in support of a successful Car-Sharing service are disappointing. Of all responding Car-Sharing providers, on average the conditions were only rated as “fair.” A better rating was given by the Car-Sharing providers in Belgium, Finland and Italy. The support at the local level through policy or city administrations was rated as average or “satisfactory.”

Car-Sharing customers

There was general consensus in the results of the customer survey. The majority of private customers are male, with only Switzerland’s Mobility setting itself apart with an almost equal gender balance. Private customers are, for the most part, between 26 and 49 years old and the majority have an above-average formal education.

Car-Sharing participants distinguish themselves in that their households own markedly fewer cars than the population average. Results of all relevant studies also show that a higher percentage of Car-Sharing customers than of the population in general posses a public transport season ticket, such as a monthly pass.

Studies that look beyond socio-demographic characteristics and also examine socio-economic categories show that despite the cost efficiency of Car-Sharing, it has not (yet) reached certain “lower class” categories. It is assumed that in these categories, the ownership of a vehicle as a symbol of belonging to society has far greater significance than the possible cost savings of participation in Car-Sharing.

From all known surveys of private customers, an exceptionally high satisfaction rate emerged with both the provider and the service. A noteworthy point is that those with an interest in Car-Sharing but no personal experience of it regularly display a certain amount of scepticism.

The quality of existing studies of business Car-Sharing customers does not match that of the studies of private customers and thus should be looked at simply as a snapshot of the customer structure of individual providers. Consistent transnational characteristics cannot be inferred from the existing studies.

In all developed Car-Sharing countries in Europe, evaluation of potential shows that the potential for attracting new Car-Sharing customers is great and is still far from being met.

Environmental benefits through Car-Sharing

Even if the environmental benefits of Car-Sharing no longer play the significant role they did in soliciting customers in the pioneering times, there is still an unspoken assumption of their value. For political support, the transport and environmental benefits assumed for Car-Sharing – which have been demonstrated by numerous independent studies in different countries – are still very important.

Car-Sharing vehicles are selected based on need. As numerous Car-Sharing journeys are taken without large amounts of luggage and without many passengers, compact cars are the predominant vehicles in Car-Sharing fleets. The fuel requirements and the CO₂ emissions of the vehicles are correspondingly small. In comparison to personal cars nationally, Car-Sharing fleets register up to 15 to 20 percent lower specific CO₂ emissions, in some cases even up to 25 percent lower.

An even more far-reaching environmental benefit results from the fact that Car-Sharing participation influences transport behaviour in a positive way, or stabilises existing environmentally-friendly attitudes toward mobility. A comparison of households before and during Car-Sharing participation shows that the proportion of car-free households grows with Car-Sharing participation and the proportion of personal cars kept in the household drops. With Car-Sharing participation, personal cars become, to a large extent, unnecessary; planned vehicle purchases are not carried out and there is no associated loss of mobility. On average, four to eight private cars are replaced by each Car-Sharing vehicle, resulting in reduced parking pressure in the neighbourhoods in which large numbers of Car-Sharing customers are well served. At least in theory, there is a significant space gain through Car-Sharing, which benefits all road users.

In addition, Car-Sharing users use public transport to a considerably higher extent than before. They also make use of bicycles, taxis or rental cars much more than they did previously.

In Switzerland, a recent study measures the effect this transport behaviour has in relation to traffic-related CO₂ emissions. In the emission calculations, the study concluded that each active Swiss Car-Sharing user emits 290 kg of CO₂ less each year because of Car-Sharing participation than he or she would without it.

The research results make it strikingly clear that Car-Sharing makes a noteworthy contribution to the reduction of the burden on transport and the environment. When integrated with the eco-modes (public transport, cycling and walking), Car-Sharing presents a city-friendly and environmentally-friendly car component that is employed selectively and sparingly by its users.

Success factors and barriers to the development of Car-Sharing

In the second-to-last chapter of the report, success factors where particular growth in Car-Sharing took place are explained and individual examples are described in detail. In the final chapter, barriers to growth are described.

Many customer surveys have shown that public transport users are much more easily attracted to Car-Sharing than are die-hard car users. Thus it makes sense that Car-Sharing providers should work in collaboration with local or regional public transport organisations and develop “package deals” to offer to the public.

Academic research has shown that both partners profit in the end. Through a unified offer, public transport operators have a new tool to help them keep customers and maintain customer loyalty. Combined products that are tied to monthly or annual public transport tickets help encourage occasional public transport users to switch to higher value products. Public transport companies also profit from the fresh, innovative image that Car-Sharing offers. Conversely, Car-Sharing providers profit from the larger customer base of the public transport provider and its multiple advertising channels. These can be used to help promote Car-Sharing at the same time. Active collaboration built on mutual trust between equals is beneficial for both partners and leads to a win-win situation.

Collaboration between STIB/MIVB (the Brussels public transport provider) and the local Car-Sharing provider in Brussels and the mobility package HANNOVERmobil are examples of particularly far-reaching and successful co-operation between transport companies and Car-Sharing companies. HANNOVERmobil has brought together a range of mobility services onto a single electronic card whose use is calculated into a single monthly mobility invoice.

A further success factor is a good mix of private and business customers at any given location. This enables a complementary use of vehicles which, in turn, makes particularly economical use of the vehicles available and improves the service to private customers at the weekend when business customers do not generally need the vehicles. A brochure from the Bundesverband CarSharing (the German national Car-Sharing umbrella organisation) offers an exemplary description of the various structures of use and motivation of business customers.

Communities and regional administrations are also important collaboration partners for two reasons. First, community administrations are important employers in their regions and they cause a good deal of work-related traffic which can, at least in part, be addressed through the use of Car-Sharing vehicles. Gaining them as business customers helps to maximise the use of the capacity of Car-Sharing vehicles on work days. In addition, supportive local policy can lead to permission to use public space for Car-Sharing stations and promotional support through local or regional information and awareness campaigns. Examples of this can be found in political support measures in Greater London, Bremen and some individual Italian cities.

State-run support programmes such as the ones in Italy and Switzerland can also help the idea of Car-Sharing to gain acceptance.

The dissemination of information on the cost effectiveness of Car-Sharing use has been identified as a further success factor, as has the well-developed user-friendly Car-Sharing technology, which plays an important role in the reliability of the service.

Inadequate political conditions have been identified as a barrier to the expansion of Car-Sharing. This includes an as yet non-existent legal basis which would allow for Car-Sharing stations in public street space. It also includes contradictory, and sometimes even counter-productive, political signals as well as support programmes and subsidies for car ownership that are implemented to the detriment of Car-Sharing growth in many countries.

Insufficient knowledge about the breadth and functionality of local Car-Sharing services and, above all, the emotional connection to the car and its significance as a status symbol can be counted as personal barriers. In addition to these barriers are the low value placed on the eco-mode of transport in some countries, the insufficient or false understanding of the costs of car ownership, and the cost structure of other transport modes when one already owns a car.

1. Introduction and overview

1.1 The momo Car-Sharing project

momo Car-Sharing has the key objective of contributing significantly to sustainable mobility patterns by establishing a mobility culture which is based on using various transport options instead of car ownership. Car-Sharing has a great, but mostly unexploited, potential at the European scale. Being a kind of decentralised car rental service, Car-Sharing supplements the sustainable transport modes of walking, cycling and public transport – thus providing an alternative to car ownership without restricting individual mobility. With Car-Sharing as a market-based service, transport can be organised more rationally and more resource-efficiently.

The European momo project aims to increase awareness, to improve the service of Car-Sharing and to increase energy efficiency within existing Car-Sharing operations. The momo consortium is composed of municipalities, Car-Sharing operators, research organisations, energy agencies and the international public transport organisation UITP. 13 organisations from eight European countries are directly represented in the project group, but momo is working to gain interest and awareness all over Europe.

The project is divided into the following work packages:

- WP 2: The state of Car-Sharing
An appraisal of Car-Sharing in Europe as at the beginning of the project.
- WP 3 Interoperability and co-modality
Barriers to co-operation with other environmentally-friendly transport modes will be identified and strategies to overcome these barriers will be described. An appraisal will be carried out of the technical systems that can be used in collaboration with other modes. How the efficiency of the collaboration with partners from other transport providers can be improved will also be studied.
- WP 4 New services of Car-Sharing
With new services in Car-Sharing, further target groups will be addressed and inspired to participate.
- WP 5 Awareness campaigns
The profile of existing Car-Sharing services will be raised through events and Car-Sharing will be brought to the consciousness of users and political supporters through awareness campaigns.
- WP 6 Increased energy efficiency in Car-Sharing operations
Although existing Car-Sharing services already contribute to an appreciable relief of the transport and environmental burden, this contribution can still be improved. Which measures are most appropriate for this purpose will be studied and tested in this work package.
- WP 7 Transfer and implementation of new Car-Sharing services
With the help of this work package, Car-Sharing will be further extended geographically. This can either happen in European partner countries in which Car-Sharing services are still limited to a few central locations, or the project can try to support the establishment of new Car-Sharing services in countries where no providers have emerged to date.

- WP 8 Monitoring and evaluation of Car-Sharing
The new services and procedures that emerge during the momo project will be continually observed and studied for their impacts. This will be done both qualitatively and quantitatively.
- WP 9/10 Dissemination and communication
Interim and final findings of the project will be disseminated and communicated. This will take place both among project partners as well as outside of the project within the support programme IEE (Intelligent Energy Europe) and the general public.

The following diagram explains the project structure and the interaction between the individual project components.

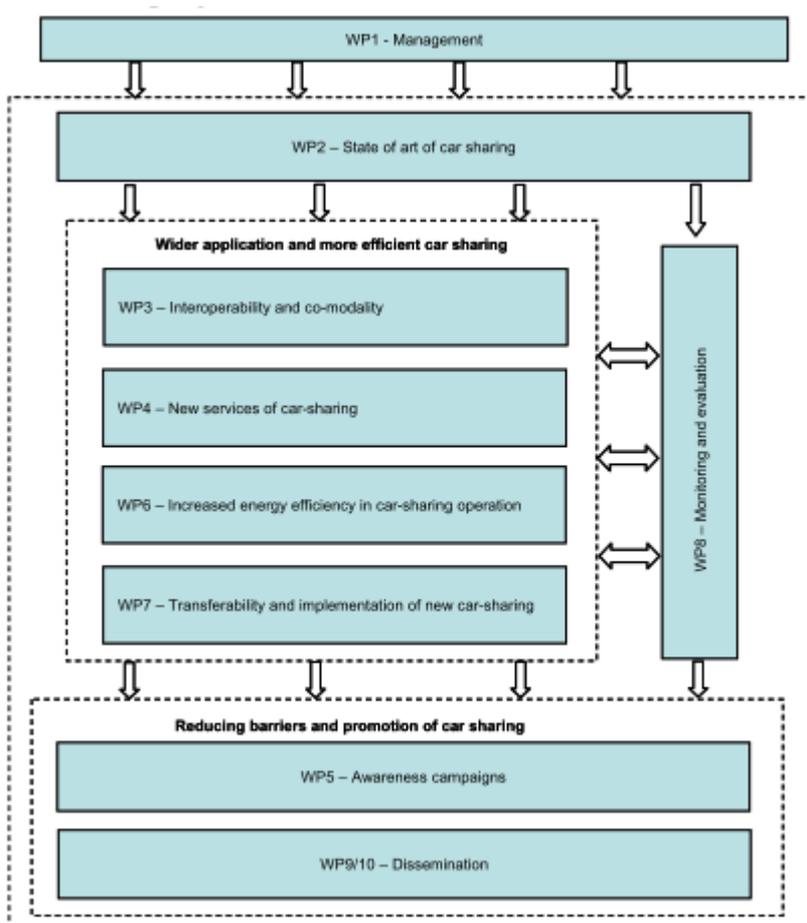


Fig. 1.1: Organisational structure of the momo project

This report is the final report of work package 2 (WP2).

1.2 Report contents

At the beginning of the project, Car-Sharing services existed to a greater or lesser degree in 14 European countries. At the beginning of 2009, approximately 380,000 Car-Sharing participants were counted in Europe, to whom approximately 11,900 Car-Sharing vehicles were available. In chapter 2, brief country reports on the state of Car-Sharing in the 14 countries will be provided and an overview of the development, provider structure and spatial distribution of the respective services will be given. The overview includes a comparative evaluation of the level achieved in the European Car-Sharing countries.

All known European Car-Sharing providers were contacted and requested to respond to a uniform questionnaire. The questionnaire comprised four theme areas: Car-Sharing use, collaboration, political support and good examples of Car-Sharing practice. The results of the questionnaire are provided in chapter 3.

Chapter 4 summarises the knowledge about Car-Sharing participants. This includes not only private customers – who mainly book Car-Sharing vehicles for free time activities – but also business customers who use the vehicles to carry out their work-related journeys. Although the focus of this chapter is current customers, it will conclude with an overview of various estimates of the growth potential of Car-Sharing in Germany and Switzerland. A recent Car-Sharing study by the international business consulting firm Frost & Sullivan will also be presented, demonstrating that Car-Sharing has also found its way into the sights of international corporations.

In chapter 5, the environmental effects of Car-Sharing will be presented as they are derived from existing studies and from user surveys. The positive effects of Car-Sharing on both traffic and the environment are the premise for the differences in political support observed from country to country for this new, innovative service. The positive effects mainly involve two components. The first is the effects that emanate from the vehicles in the Car-Sharing fleets themselves. The second component is the positive influence that Car-Sharing services have over participants' transport behaviour. That's to say, Car-Sharing participants both reduce the number of kilometres they travel by car and also increase their use of other environmentally-friendly transport modes. Even if Car-Sharing is not the causative factor in each individual case where users decide on an environmentally-friendly mode of transport, it supports their sustainable behaviour without their mobility options being limited.

Chapter 6 describes the success factors for an above-average growth in Car-Sharing and illustrates these with individual examples. The motivations and actions behind successful partnerships are described. The significance of political support for Car-Sharing is also explained so that the positive effects described in chapter 5 can be put into play in the reality of the urban traffic situation. It has been determined that, under certain conditions, in comparison to car ownership, Car-Sharing is a cost-efficient mobility service.

Finally, chapter 7 describes the factors that inhibit Car-Sharing participation and growth in customer numbers. Here, the main issue is the symbolic significance of the car, whose ownership, for most car-owners, is equated to social status and participation in society.

Car-Sharing as a sustainable mobility service

Services can be seen as sustainable in its original sense, if both environmental, economic and social benefits result. In chapter 5, the positive environmental effects of Car-Sharing are demonstrated at length. In chapter 6, it is pointed out that, for those car drivers who drive

fewer than about 10,000 to 12,000 kilometres annually and who don't (need to) drive daily, Car-Sharing services present a cost-effective service in comparison to the ownership of a car. In addition, Car-Sharing presents a social service for people who, in the absence of alternatives, would be cut off from mobility options and who wouldn't be able to fulfil certain of their mobility wishes without this access to a car. Car-Sharing providers themselves also create jobs that, due to their nature, are largely locally organised and not subject to being moved.

Several years ago, the Swiss Car-Sharing provider Mobility switched over to publishing its annual report as a business and sustainability report. It is exemplary in pointing out how Car-Sharing providers simultaneously generate environmental, economic and social benefits. That's to say, they function sustainably in the full sense of the word.

In contrast to mass personal car ownership and its dominating effect, Car-Sharing is a sustainable mobility service. In other words, with Car-Sharing, the natural resources and development opportunities of future generations will remain – not only in developed countries, but also as a model for other regions of the world. The better the market potential is realised, the farther the sustainability effects of Car-Sharing services can be spread. For this reason, the German Bundesverband CarSharing e. V., the umbrella organisation of German Car-Sharing providers, signed the UITP charter for sustainable development. In doing so, it declares to the international public transport organisation that it places its organisation and its publicity efforts at the service of sustainable transport and advises its member organisations in the same spirit.

2. State of Car-Sharing in Europe

2.1 Overview

Fourteen European countries currently have Car-Sharing operations. Table 2.1 gives the number of participating customers and the vehicles available as at the beginning of 2009. Further details on Car-Sharing in Europe will be presented in following sub-chapters.

Country	Car-Sharing customers	Car-Sharing vehicles	Notes and sources
Austria	11,000	169	As at the beginning of 2009; momo survey in WP2
Belgium	6,932	248	As at the beginning of 2009 (excluding those involved in car sharing among neighbours), momo survey in WP2
Denmark	approx. 5,000	225	As at the middle of 2009; Danske Delebiler 2009
Finland	2,232	38	As at the beginning of 2009, momo survey in WP2 (for October 2009, 2,500 customers are registered)
France	13,000 (estimate)	700 (estimate)	2008: 9,550 participants, with a growth rate of 57% in one year; Certu 2008
Germany	137,000	3,900	As at 01.01.2009, bcs 2009
Great Britain	64,679	1,459	As at January 2009; Carplus 2009 (as of the end of August 2009, 2,086 vehicles were registered)
Ireland	63	9	As at the beginning of 2009; momo survey in WP2
Italy	15,850	498	As at the beginning of 2009; momo survey in WP2
The Netherlands	27,000 (estimate)	1,832	As at March 2009; Metz 2009
Portugal	100	12	As at the beginning of 2009; momo survey in WP2
Spain	2,504	127	As at the beginning of 2009; momo survey in WP2
Sweden	14,889	more than 492	As at June 2009, Schillander 2009
Switzerland	84,500	2,200	As at the end of 2008, Mobility 2008
Total	384,749	11,909	

Table 2.1: Car-Sharing customers and vehicles in Europe

2.2 The state of Car-Sharing in European countries

2.2.1 Austria

In Austria, professional Car-Sharing today is organised by a single provider which is active nationwide. Car-Sharing was started in 1997 as one division of the Denzel Group, together with car rental and other car-related services. In 2003, the car rental division and the Car-Sharing service were merged under the name Denzeldrive. At the beginning of 2008, the Swiss Car-Sharing provider Mobility joined them. Since then, Austrian Car-Sharing services have been run by a joint venture called Denzel Mobility CarSharing GmbH with its head office in Vienna.

As at the beginning of 2009, Austria's 11,000 Car-Sharing customers shared 169 vehicles. While Car-Sharing is offered in 20 Austrian cities, Vienna, with more than half of all vehicles, has by far the largest operation.

2.2.2 Belgium

Professional Car-Sharing in Belgium has existed since 2002. Within the context of the EU MOSES project, Car-Sharing was first implemented in September 2002 in the Wallonian part of the country. Service in Brussels followed in May 2003 and a year later, the first Car-Sharing service began in Flanders.

As at the beginning of 2009, there were 6,932 Car-Sharing users registered in Belgium using the 248 Car-Sharing vehicles available in the country. At the beginning of 2009, there were 12 Belgian cities with Car-Sharing services. By October 2009, cambio's coverage had expanded to include 18 Belgian cities.

Professional Car-Sharing is organised by Optimobil Belgium and marketed under the name cambio (Belgium). Optimobil Belgium is an example of a well-run operating group that learnt its lessons from the pioneer organisations of European Car-Sharing and was able to implement them in their own national growth strategies. The organisational structure reflects this: the three initial shareholders of the national provider are the environment and transport organisation Taxistop, which works in the non-profit sector, a national automobile club, and the German Car-Sharing provider cambio. In December 2009 a fourth partner joined as shareholder, the Belgian railway association NMBS-Holding.

Five years before it began providing service, Taxistop had already started preparing for the founding and had made contact with other Car-Sharing providers in Europe. Cambio brought its deep knowledge of the organisation of Car-Sharing as well as its market-ready system components into the alliance. All of this was developed in several languages for the project launch in Belgium. The national provider Optimobil, for its part, founded operating companies in the different areas of the country to take care of business operations. The respective regional public transport providers are involved in these companies in each of the geographical areas.

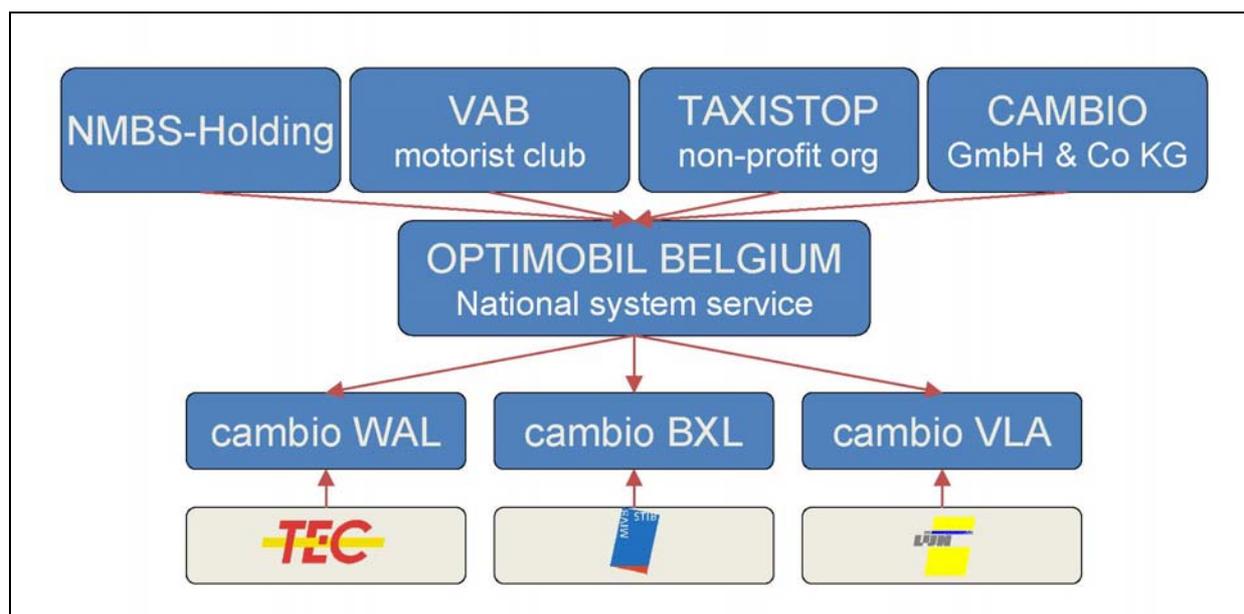


Fig. 2.1: Organisational structure of Belgian Car-Sharing provider, since December 2009 (Van Kesteren 2010)

Added to this, they also have the political support of the respective regional governments in all areas of the country, which see Car-Sharing as part of an environmentally-friendly transport policy. Apart from the institutional shareholders, the transport companies work actively in co-operation with the regional Car-Sharing providers, developing joint “package deals.” A current growth rate of 35% within a year affirms the direction they’ve taken.

Unlike most other European countries, there exists in Belgium – in the form of Autopia vzw – an independent organisation which has as its mission furthering and supporting the sharing of cars among circles of friends and neighbours. Thus, in Belgium, we also have access to the information about this more informal private sharing of cars, insofar as they have associated with Autopia. As of the beginning of 2009, there were 650 registered participants sharing 110 private cars in twelve Belgian cities. An average group consists of five to eight households.¹

Groups who engage in car sharing among neighbours are not seen as competition to professional Car-Sharing providers or as a transition stage, but rather welcomed as a parallel but autonomous form to professional Car-Sharing.

2.2.3 Denmark

Car-Sharing services have existed in Denmark since 1997. In December 1997, the first Car-Sharing organisation (which no longer exists) started in Odense. Barely a year later, Hertz Delebiler started in Copenhagen and the Aarhus Delebilklub started in Aarhus. Currently, there are ten providers offering Car-Sharing in 24 Danish locations (Danske Delebiler 2009). Danske Delebiler functions as an umbrella organisation for Danish Car-Sharing providers.

As at mid-2009, there were approximately 5,000 participants registered with these providers sharing 225 vehicles. The large concentration of services in the capital region is striking; almost half of all vehicles and stations are provided by the largest provider, Hertz Delebilen,

¹ For further information on Autopia, see momo fact sheet #10.

which is also the only commercial enterprise among the Danish Car-Sharing providers (Desaulniers et al. 2007).

2.2.4 Finland

In Finland, City Car Club, located in Helsinki, is currently the only Car-Sharing provider. At the beginning of 2009, it had 2,232 customers sharing its 38 vehicles. Almost one fifth of the users are business customers who use Car-Sharing for professional purposes (Laine 2009). Finnish Car-Sharing is limited to the capital Helsinki and three locations in the surrounding area, and started in March 2000. Since 2003, City Car Club has also operated a Car-Sharing service in Sweden (Stockholm and Gothenburg).

One feature in the organisation of the Car-Sharing service in Helsinki distinguishes it from all others in Europe. There, the principle of “one Car-Sharing parking spot, one vehicle,” as is standard for other European providers, does not apply. Rather, the 38 Car-Sharing vehicles are distributed across 92 stations. This means that the vehicles aren’t allocated to specific stations, but rather are used and booked variably. Car-Sharing customers can reserve vehicles at a station even when no vehicle is there at the time of the booking. With a lead time of at least two hours, the operator guarantees the customer will find his or her car at the desired station. This is made possible by, among other things, the fact that vehicles undergoing maintenance are subsequently delivered to the stations at which they are needed. Customers also aren’t required to return vehicles to the same station they began their booking at. When they reserve, they must simply specify which station they will leave the car at after their booking. According to reports from the operator, this system has worked without problem and without any appreciable extra effort on the part of the service staff since the service started in 2000.

2.2.5 France

The first Car-Sharing service started in 1999 in La Rochelle and Paris. Currently, there are 18 known providers, most of whom are only active in one city. 18 French cities have a Car-Sharing service; however, not all cities with populations over 200,000 are served.

In 2008, a French census indicated that there were 9,550 Car-Sharing participants, to whom 548 vehicles were available (Certu 2008). Since there was a 57% growth in customer numbers in that year, this review assumes approximately 13,000 Car-Sharing participants and 700 vehicles at the beginning of 2009. The three providers in the capital, Paris, account for approximately 60% of all French Car-Sharing participants.

There is currently a strong vitality in the French Car-Sharing market. In the period 2007-2008, eight new providers started up.

The local government of Paris is particularly supportive of Car-Sharing. If a provider fulfils established criteria, it can obtain a city-provided Car-Sharing label, which brings particular privileges. These include joint advertising with the city, attractive prices on the rental of parking spaces in car parks and reserved parking spots in public street space. In 2008, three providers (Caisse Commune, Mobizen and Okigo) obtained this label. A law passed in 2009 opens up the possibility that Car-Sharing providers can apply for such a label nation-wide.

France Autopartage is a consortium of ten local Car-Sharing operators, which does not, however, include those that are active in the French capital. The goal of this co-operative consortium is the development and operation of common system technologies, a shared booking system, and shared procurement of vehicles and of vehicle insurance.

2.2.6 Germany

At the beginning of 2009, German Car-Sharing providers together accounted for 137,000 Car-Sharing participants. Thus, 20 years after Car-Sharing was first introduced, German Car-Sharing claimed top spot in Europe (based on absolute number of participants). 3,900 Car-Sharing vehicles were available to them. 2008 was the second consecutive year with a net increase of more than 20,000 customers (i.e. after accounting for the loss of other participants over the course of the year).

Car-Sharing is offered in 270 German cities and communities. In all cities over 200,000 and in almost all cities with more than 100,000 inhabitants, there is at least one Car-Sharing provider. The smaller the population, the fewer the Car-Sharing operations.

The provider structure in German Car-Sharing is very unhomogenous and decentralised. There are approximately 110 providers on the market, and the transition from formal Car-Sharing to the informal sharing of cars among neighbours (with closed membership) is somewhat fluid. There is a tendency, especially among the larger Car-Sharing providers, toward amalgamation into larger groups, or at least closer collaboration; however, new independent Car-Sharing providers continue to emerge.

The biggest groups of providers are in the group amalgamated by Stadtmobil in Stuttgart, Karlsruhe, the Rhine-Neckar region, the Rhine-Main area, Hanover and other smaller start-ups in Berlin and in the Ruhr area, as well as the cambio group with operations in the northwest (Bremen, Hamburg, Bielefeld, Cologne, Aachen, Saarbrücken and another small start-up in Berlin). German Rail organises its own Car-Sharing programme at all major train stations in Germany as well as city-wide services in Berlin and, as from spring 2009, in Cologne and Stuttgart as well. They also bring together other individual providers (for example book-n-drive in the Rhine-Main area, teilAuto in eastern Germany, Stattauto Munich, einfach mobil in Marburg, Giessen and Kassel, the Drive CarSharing group) under the umbrella of the Car-Sharing system platform DB Carsharing. All of these use the call centre of German Rail as well as its booking and billing services. Other large individual providers are Greenwheels Deutschland, CarSharing Südbaden-Freiburg, and Stadtteilauto Münster. There are over 50 other smaller independent providers that don't belong to any of the above mentioned groups and that each have fewer than 20 vehicles in service. These days, customers in many large cities can choose between comparable Car-Sharing services from several competing providers.

The German Car-Sharing providers established the Bundesverband CarSharing e. V. as a political umbrella organisation. 95 to 97 per cent (depending whether you count the number of participants or the number of vehicles) of the German Car-Sharing market is accounted for by members of the Bundesverband CarSharing.

2.2.7 Great Britain

Great Britain is currently the European country with the most dynamic growth in Car-Sharing. While there were 32,000 Car-Sharing customers registered in Great Britain in December 2007, this number doubled to 64,000 within a year (Myers, Cairns 2009, p. 1).

Although small local Car-Sharing providers date back to the 1970s, modern Car-Sharing began in March 1999 with the Edinburgh City Car Club (ERC 2007, p. 2). The service was established through grant funding of £250,000 from the city of Edinburgh, the British Ministry of Transport and the Scottish government. Business operations were taken on by the car rental agency Budget Rent-a-Car, which withdrew after two years for internal financial

reasons. In November 2001, Car-Sharing services were re-introduced after receiving a further £40,000 from the Edinburgh city administration. The re-launch of Car-Sharing services through City Car Club succeeded and the provider expanded its mobility services successively to other British cities and is today the second largest Car-Sharing organisation in Great Britain.

Currently only four large commercial and 12 smaller Car-Sharing providers are listed on the website of Carplus, a national non-profit organisation that promotes responsible car use (see www.carclub.org.uk). As at the beginning of 2009, these were active in 43 locations (Carplus 2009a). While this number suggests a reasonably well developed nationwide service, a closer analysis discloses a large imbalance. Three quarters of the Car-Sharing cars located in Great Britain are stationed in metropolitan London (Carplus 2009b). The cities of Edinburgh, Leeds, Brighton and Bristol alone offer more than 25 vehicles.

The four large providers, Streetcar, City Car Club, Zipcar und Connect by Hertz are all represented in the London Market and share it among themselves. Two of these providers also offer Car-Sharing services in other large British cities.

The current level of British Car-Sharing growth is due mainly to its development in London, and this, notably, through the support of Transport for London. TfL, the central co-ordination and planning authority for traffic in Greater London, is under the direct control of the Mayor of London. TfL has identified Car-Sharing as a traffic reduction measure which contributes to the reduction in private car ownership and relieves traffic congestion. Consequently, a Car-Sharing development strategy was passed which should be achieved by 2011. At that point, according to the politicians, Car-Sharing services will have achieved a market-readiness that will ensure continued market-led growth (TfL 2008). Further details on this support programme are described in chapter 6 (Community Support).

Car-Sharing development is likewise supported in other regions. From 2001 to 2004, Carplus spearheaded a Car-Sharing development programme for rural areas. At the end of that period, in March 2004, six of 13 regions in the programme had put Car-Sharing services on the road. Three others were to start at a later date (Carplus 2004).

Recently, Carplus submitted a plan to the British Ministry of Transport for the advancement of a network of Car-Sharing organisations. The very ambitious plan envisions a growth in the Car-Sharing network in Great Britain to 180,000 participants and 8,000 vehicles within four years (Carplus 2007) at an expected cost of £12.8 million of public funds. This growth rate is tenfold higher than the growth level that would be expected from market forces alone.

2.2.8 Ireland

The Car-Sharing service in Ireland, GoCar, was launched officially by the Minister of Transport during European Mobility Week in September 2008. GoCar is operated by sustainable transport consultancy, Mendes GoCar Limited, which works closely with the German provider cambio and uses their system platform. The service was started in Ireland's second largest city, Cork, with 8 vehicles at 3 car stations. At the beginning of 2009, 63 authorised drivers were registered in Cork. These were spread over 17 private customers, 3 business customers, University College Cork and Cork City Council. Mendes GoCar Limited has a three year agreement with Cork City Council for the block booking of 3 cars during working hours for exclusive use by its staff.

2.2.9 Italy

As at the beginning of 2009, eleven organisations were offering Car-Sharing services with a total of 13,208 active cards and 15,850 estimated customers who had access to 498 shared vehicles. At that time, 31 cities offered Car-Sharing services. In March 2009, a new service was added in Palermo, initially with 20 vehicles.

Apart from an overlap of two companies in Milan, the providers all operate in separate regions of the country. The first Italian Car-Sharing service started up in 2001 in Milan, followed by Bologna and Venice in August 2002.

Unique in Europe (and beyond), the development of Car-Sharing organisations in Italy was facilitated by far-reaching governmental support. After Decree 179 of the Italian Ministry of Environment on sustainable mobility policy, the ministry founded Iniziativa Car Sharing (ICS), an agreement between municipalities which was established to

- ensure the development of the different Car-Sharing services in the country's most important cities in a unitary network,
- guarantee "professional standards" of the service to the users,
- promote the awareness of Car-Sharing all over the country,
- ensure a full interoperability among all the different local services and operators (ICS 2003).

Cities and regions were prompted by the ICS to launch Car-Sharing services. How the companies founded for this purpose were organised was left up to the local partners by the ICS. Thus many Italian Car-Sharing providers are in the hands of the local authorities or subsidiaries of local transport operators. The advantage of this is that a close collaboration with the local provider of public transport and with local transport policy is built in from the outset. Access to Low Emission Zones and free parking in the "Blue Zones" of city centres as well as the use of bus lanes are privileges that Italian Car-Sharing users can take advantage of in all the cities.

Within the limits fixed by the service standards, the individual local operators have autonomy in all the operational, commercial and managerial aspects. In particular they are responsible and free regarding:

- their price schemes and market policies;
- investments and other developments;
- co-operation and integration with local bodies and other companies who provide Car-Sharing service.

However, local operators have to respect all the ICS standards and to adopt the same technology.

In the first phase, the acquisition of the technical infrastructure for newly-founded Car-Sharing operators was supported through a capital investment grant of up to 50% from the Environment Ministry, to a total funding allotment of approximately 9 million Euro (ICS 2009). In 2005, the Environment Ministry made a further 10 million Euro available.

Local operators have to finance local projects but they can ask ICS to plan and project the service for free, refund the costs for the purchase of goods and services identified as standardisation and interoperability key-factors and plan and accomplish a unitary promotion

action all over the country. ICS co-funding is normally a maximum 20-25% of profit and loss account.

2.2.10 The Netherlands

In March 2009, 1,832 Car-Sharing vehicles were available to an estimated 27,000 customers in the Netherlands (Metz 2009). The Car-Sharing market is served by six commercial providers who have Car-Sharing vehicles stationed in 88 Dutch communities. With this, 8.2 million citizens, or half of the population, could theoretically take advantage of Car-Sharing services in their city or community.

By far the largest, and also the oldest, Dutch provider is Greenwheels, which alone possesses approximately 1,100 vehicles. The largest Car-Sharing demand is found in Amsterdam. Four commercial providers are active there. 700 vehicles belong to Greenwheels, while the other providers operate the remaining 300 vehicles in the city. The density of Car-Sharing vehicles in Amsterdam comes to more than 100 per 10,000 residents. Nevertheless, the city of Amsterdam plans to double the number of Car-Sharing vehicles within the city in a short period of time and is also prepared to put up money to provide investment grants.

In addition to the commercial providers, the non-profit organisation Wheels 4 all – an instrument for privately-organised sharing of cars among neighbours – and their members are active in 59 communities.

Commercial Car-Sharing began in the Netherlands in 1994 (Nanninga, Eerdmans 2006, p. 5).

2.2.11 Portugal

At present, there is one Car-Sharing provider in Portugal, which started in September 2008 in Lisbon during European Mobility Week. As at the beginning of 2009, twelve vehicles were available for the use of approximately 100 private and business Car-Sharing customers.² Portugal's first Car-Sharing service was organised by Carristur, a subsidiary of the public transport operator of Lisbon, which is responsible for, among other things, the organisation of extra services for tourists in parallel to regular public transport services.

2.2.12 Spain

In Spain, there is currently only one Car-Sharing provider, Catalunya Carsharing SA, which serves the Barcelona region under the name AVANCAR. This service started in 2005. As at the beginning of 2009, they had 2,504 customers sharing 127 vehicles. Apart from the city of Barcelona itself, Car-Sharing services are also available in three neighbouring towns.

As in Ireland, as at January 2009, Spain does not have a Car-Sharing service in its capital and largest city.

2.2.13 Sweden

In June 2009, the Swedish Car-Sharing providers had 14,889 eligible drivers, with access to a fleet of approximately 500 Car-Sharing vehicles (Schillander 2009). Car-Sharing is offered in 37 Swedish towns and cities.

The structure of the service is very unhomogenous. It is striking, first of all, that only seven of the total 45 providers have more than 100 customers or more than 10 vehicles available.

² Results from the momo questioning in WP2

Secondly, in the largest Swedish cities of Stockholm and Gothenburg, there is a multitude of providers on the market (Gothenburg has ten providers while Stockholm has nine).

Only two providers are active in more than one place. The local orientation of the majority of providers is made clear by the fact that the town name is generally part of the provider's name. Only the largest provider, Sunfleet, with services in 15 locations in Sweden, has relatively broad coverage. Sunfleet is a subsidiary of the car rental agency Hertz and the Swedish car manufacturer Volvo and has been active in Car-Sharing since 1998.

2.2.14 Switzerland

Switzerland can, for a variety of reasons, be called the motherland of Car-Sharing. The first modern Car-Sharing service was implemented there. And, after more than 20 years of growth, Switzerland has – based on population numbers – reached a service and customer density level that is unique in the world.

In May 1987, two Car-Sharing organisations were founded independent of one another in Switzerland: the AutoTeilet Co-operative in Stans and the ShareCom Co-operative in Zurich. Ten years later, at the members' meetings of the two organisations in March 1997, they agreed to a merger and today's Mobility Co-operative was created. It is the only Car-Sharing provider in Switzerland today.

As at the end of 2008, Mobility had 84,500 customers who had access to 2,200 vehicles in the whole of Switzerland. Car-Sharing services are available in 430 cities and communities. This is an astounding level of coverage considering that there are only five cities in Switzerland with populations over 100,000 and only four others with between 50,000 and 100,000 inhabitants. Thus the majority of Swiss towns in which Car-Sharing is offered are of a size at which, in other European countries, virtually no Car-Sharing services can be found.

Equally exemplary, considering that Switzerland has a population of only 7.7 million, is the large participant density. Based on population, Mobility has seven times more Car-Sharing demand than Germany, which has the highest level of Car-Sharing participation in absolute numbers.

But Car-Sharing services are not distributed equally throughout the entire country. It is noteworthy that in German-speaking northern Switzerland, there is a very dense network of Car-Sharing locations, whilst in French-speaking western Switzerland there is a markedly lower level of coverage and in Italian-speaking southern Switzerland, there are areas with large gaps in service. According to Mobility data, this however has less to do with attitude differences of the inhabitants in the different regions of the country and much more to do with the development status of Mobility itself. In Italian-speaking Ticino, Car-Sharing services have thus far not been as well promoted.

The unprecedented success of Mobility can be attributed to a number of factors. The Car-Sharing provider has established a multitude of agreements with public transport providers and transport associations as well as with Swiss Rail, all of which have brought them a good number of customers. They have collaborations in other areas as well, for example with the retail chain Migros, with the post office, and with the Swiss Touring Club, the largest car association in the country. It is striking that several firms promote themselves using Mobility vehicles and thus benefit from the nationwide good image of the Car-Sharing provider. The Mobility brand enjoys a high level of brand awareness in the country. (This does not, however, mean that the way Car-Sharing works is well understood; it is still generally poorly understood by potential customers.)

It should also be pointed out that the Mobility Co-operative has been distributing a very informative company and sustainability report for several years which describes excellently Car-Sharing services and the organisation's principles by means of the three pillars of sustainability (economic, social and environmental).

2.3 Comparative estimate of Car-Sharing growth

In the introductory overview (Table 2.1), numbers of Car-Sharing participants and vehicles in the individual European countries are listed. These numbers alone, however, say little about the success that the Car-Sharing providers in these countries have had to date. The population numbers in the European Car-Sharing countries are too different for that. The time since the beginning of Car-Sharing in each country also needs to be taken into account. This information is shown in Figure 2.2. (Even more informative as a point of comparison would be the number of driving licence holders in the various European countries as opposed to total population numbers, but unfortunately no up-to-date numbers are available.)

It is clear that Switzerland has, by a large margin, the highest growth in Car-Sharing participation in relation to population numbers. As at the beginning of 2009, almost 1.1 per cent of the population were registered as customers of the Car-Sharing provider Mobility. Germany, the Netherlands and Sweden come a distant second with 0.16 , 0.16 and 0.17 per cent respectively. Thus, based on the proportion of the population that participates in Car-Sharing, Switzerland is approximately seven times better than the next countries. Put differently, if Germany had comparable participation numbers to Switzerland, it would have 900,000 Car-Sharing customers.

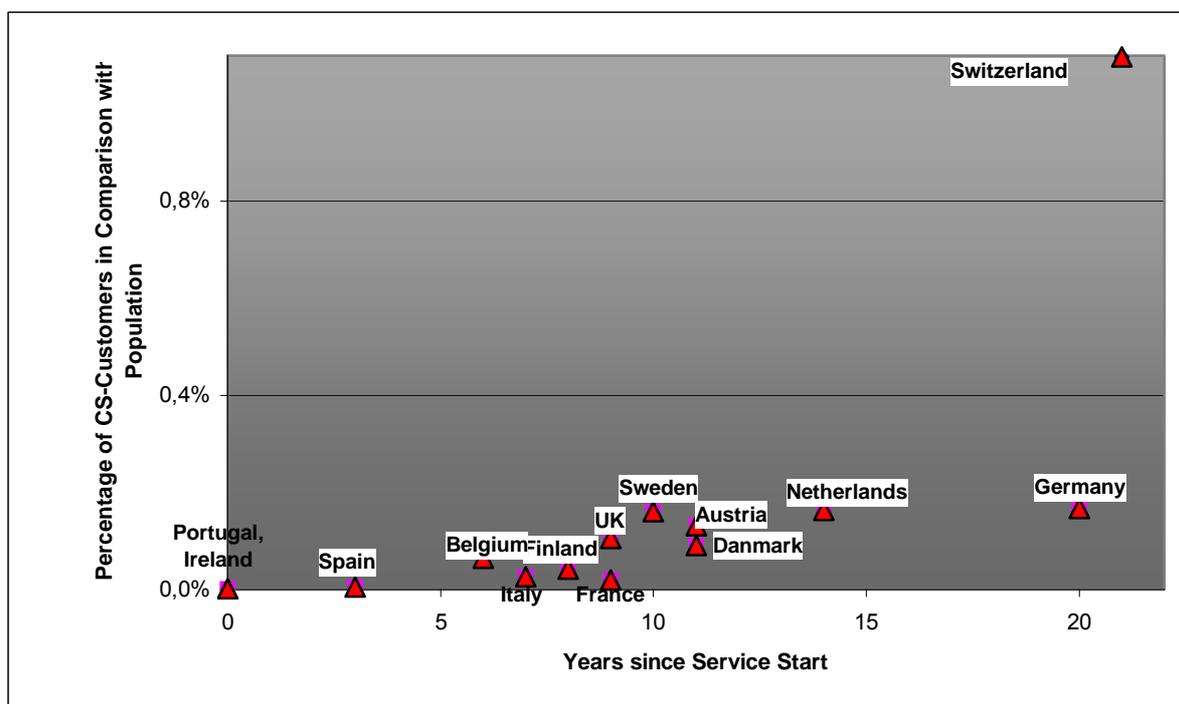


Fig. 2.2: Car-Sharing participants in European countries in relation to total population

To illustrate more clearly the level of development of the rest of the European Car-Sharing countries, the same data as in Figure 2.2 are used in Figure 2.3, with Switzerland removed. The scale of the graph has been adjusted to the remaining countries and a trend line of the

development has also been added, which likewise excludes Switzerland. This makes clear which European countries have achieved above-average development since the establishment of the first Car-Sharing services and where growth is comparatively slower.

After Switzerland, Belgium, Great Britain, Sweden, Austria and the Netherlands thus show an above-average growth rate, while Spain, Italy, Finland, France, Denmark and Germany remain behind. In the case of Germany, one possible explanation is that a great deal of ground-breaking work had to be done there as a Car-Sharing pioneer and thus its start was less dynamic than in the more recent starters. On the other hand, Switzerland had to struggle with the same growing pains in its first years and it evidently overcame them much better, or at least much more quickly, than Germany did.

For the above-average Car-Sharing countries Great Britain and Sweden, as well as, to a certain degree, Austria, it is noteworthy that Car-Sharing services are most in demand in the respective capital regions, while in the rest of the country, a good deal of development potential has yet to be realised. The situation is similar in the Netherlands, except it is not the capital, but rather the area around Amsterdam that is a particular Car-Sharing growth region.

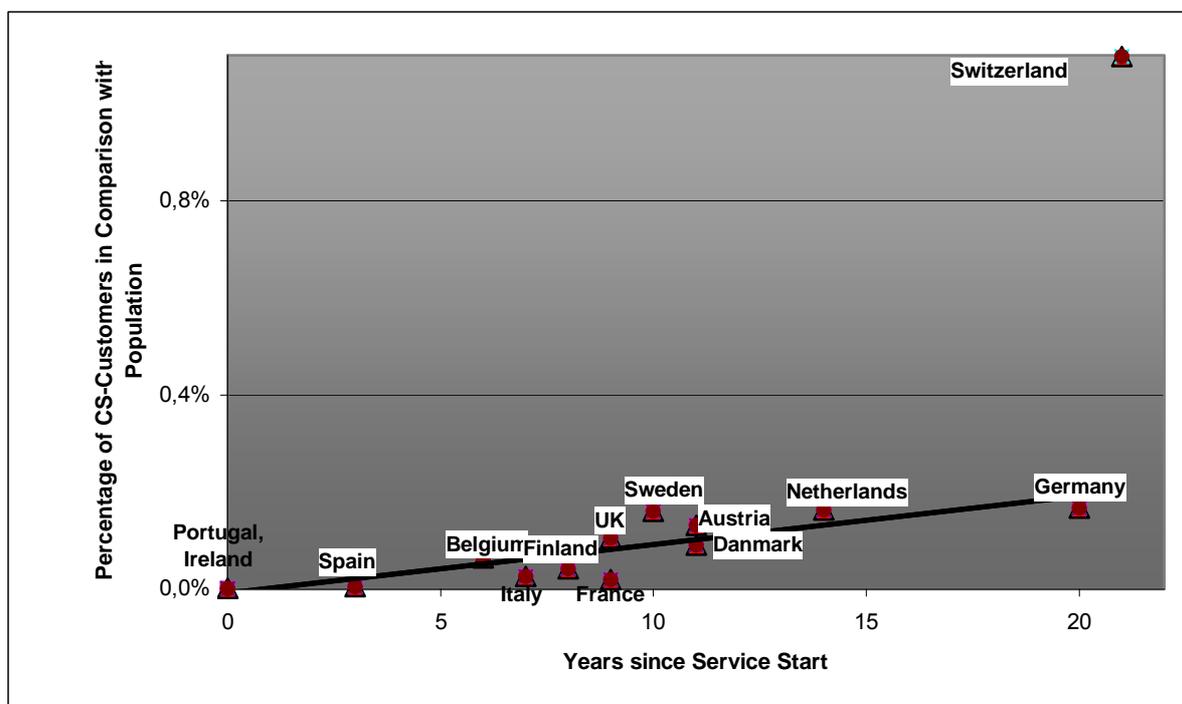


Fig. 2.3: The trend of Car-Sharing participation shows both above and below average Car-Sharing growth

3. Survey of European Car-Sharing providers

At the beginning of the momo Car-Sharing project, a survey was carried out of all known Car-Sharing operators in Europe. The results of the surveys will be presented in this chapter.

3.1 Survey method

The survey of Car-Sharing providers in the European countries with existing Car-Sharing services was sent as a written request by e-mail. As a first step, the e-mail addresses of all known Car-Sharing providers were researched and compiled.

In a parallel process, the questionnaire was developed by an internal working group of those momo partners responsible for work package 2. The goal of this step was to identify the most important questions through which the current state of Car-Sharing in Europe could be described. In addition, information was to be gathered which could be used in other work packages of the momo Car-Sharing project. It was known from earlier queries that Car-Sharing providers are asked by many institutions to fill out questionnaires of varying lengths and thus a certain “survey fatigue” was to be expected. For this reason, the questionnaire also needed to be kept relatively brief.

It was decided that two separate questionnaires of different lengths would be developed. The questionnaire that went to the Car-Sharing organisations in the momo partner countries was more detailed. A somewhat shorter questionnaire was sent to the Car-Sharing providers in European countries in which there were no direct contacts through momo partners. Switzerland and Austria were exceptions as direct contact to the Mobility Co-operative had already been established. In the context of this chapter, in the interest of simplicity, Switzerland and Austria are referred to as “momo partner countries.”

The questionnaire includes the four topic areas Car-Sharing use, co-operation, political support and good examples of Car-Sharing in use.

The questionnaire was sent as follows: in the momo partner countries, the project partners took on the distribution of the questionnaires to the Car-Sharing providers in their respective countries. Responses and reminders also went through the project partners. For all other European countries in which there were Car-Sharing services but no momo partner available, the momo partner responsible for WP2, the Bundesverband CarSharing (bcs), the umbrella organisation for Car-Sharing in Germany, carried out e-mail distribution of the questionnaires. Contact with Switzerland’s Mobility was likewise through bcs.

3.2 Return of the questionnaires

In total, 205 known Car-Sharing operators in European countries were written to and requested to complete the survey. 131 of these recipients were located in momo partner countries and in the two associated countries, Switzerland and Austria. Except in Germany, all surveys were returned. In Germany, with its very decentralised provider structure, the return rate of completed questionnaires was 59%. This somewhat unsatisfying result is related in part to the fact that not all Car-Sharing providers in Germany are members of the bcs and contact with these organisations is less direct, and in part to the above-mentioned flood of requests to complete questionnaires and the associated reluctance to take part in further surveys.

In the European countries not covered by partners in the momo consortium, the return rate was significantly lower. Here, despite repeated reminders, the rate of return of completed questionnaires stood at 31% of the providers contacted.

In total, 108 European Car-Sharing providers completed and returned a questionnaire. The return is thus seen as sufficiently representative.

Detailed information on the dispatch of the questionnaires and the return of completed questionnaires can be seen in Table 3.1.

Country	Number of questionnaires	Completed questionnaires returned
Overall survey results		
Total questionnaires sent	205	100%
Completed questionnaires returned	108	53%
from momo partner countries		
Total questionnaires sent	131	100%
Completed questionnaires returned	84	64%
from Belgium	2	100%
from Germany	68	59%
from Finland	1	100%
from Ireland	1	100%
from Italy	11	100%
from Spain	1	100%
from associated partner countries		
from Austria	1	100%
from Switzerland	1	100%
from other European countries without momo partners		
Total questionnaires sent	72	100%
Completed questionnaires returned	22	31%

Table 3.1: Return of completed questionnaires

The quality of the questionnaire return cannot be inferred based only on the number of completed questionnaires as the size of the individual providers also allows them to have a significant influence on the representativeness of the survey. In order to address this aspect of representativeness, Table 3.2 will – at least for the momo partner countries – compare the number of Car-Sharing vehicles of the responding providers with the total number of known Car-Sharing vehicles. Car-Sharing vehicles are used as a standard of comparison because, from among the basic data available on Car-Sharing services, they are most easy to objectify.

From the list in Table 3.2 (based on Car-Sharing vehicles), compared with Table 3.1 (based on the number of Car-Sharing providers) it is evident that although, overall, representative-

ness based on the number of organisations is the same as representativeness based on Car-Sharing vehicles in service, nonetheless, significant differences appear between the momo partner countries (including associated countries) and the other European countries. The difference in the momo partner countries comes about through the return in Germany. Here, comparatively larger Car-Sharing providers – with more Car-Sharing vehicles in service than average – responded (number of returns 64% as opposed to 59%). Thus one can assume a better representativeness is attained based on Car-Sharing vehicles than simply on the number of providers who responded. With the other European countries, the opposite effect is apparent (number of returns 12% as opposed to 31%). Here, the larger providers are noticeably absent in the responses to the questionnaire. This also comes up in Table 3.2.

Country	Number of Car-Sharing vehicles of responding providers	Proportion of all Car-Sharing vehicles
Overall survey results		
Vehicles of all providers contacted	11,909	100%
Vehicles of responding providers	6,463	54%
from momo partner countries		
Vehicles of all providers contacted	4,820	100%
Vehicles of responding providers	3,526	73%
from Belgium	358	100%
from Germany	2,496	64%
from Finland	38	100%
from Ireland	9	100%
from Italy	498	100%
from Spain	127	100%
from associated partner countries		
from Austria	169	100%
from Switzerland	2,200	100%
from other European countries without momo partners		
Vehicles of all providers contacted	4,720	100%
Vehicles of responding providers	568	12%

Table 3.2: Representativeness of returned questionnaires using the example of the criterion Car-Sharing vehicles

3.3 Selected survey results

The data in the following sub-chapter are based on the survey results of the 108 European Car-Sharing providers who filled out the questionnaire sent to them within the context of the momo project. Since the individual questionnaires were filled out with varying degrees of completeness (i.e. individual questions weren't answered either because the information wasn't available or because the content of individual questions was seen as too sensitive), in the following tables, the number of responding Car-Sharing providers is given (n = number of providers who responded to this question).

The analysis is limited to the questionnaire sections Part A (information on Car-Sharing use), Part B (co-operation) and Part C (political support). The responses to the open-ended questions in Part C are covered in more detail in chapters 6 and 7 of this report. Part D of the questionnaire (good examples of Car-Sharing in practice) were used in the pre-selection of the exemplary Car-Sharing practices that were detailed in the ten thematic fact sheets as another deliverable for Work Package 2.

For some analysis, in addition to looking at results for all Car-Sharing providers, it was deemed useful to also differentiate between larger (more than 500 customers or 20 vehicles) and smaller (up to 500 customers or 20 vehicles) providers. This seemed appropriate as numerous smaller providers are run solely by volunteers and therefore have a somewhat less polished image. In many cases, large providers can also be equated with Car-Sharing services in large cities or metropolitan areas, while smaller providers often cover geographical niches in smaller cities or even in rural areas.

Where it is appropriate for the interpretation of the results, analysis is also differentiated by country.

3.3.1 Findings on Car-Sharing use

Start of service

The responding Car-Sharing providers have been in operation for very different lengths of time and cover the entire spectrum of existing modern Car-Sharing services in Europe. In Switzerland, Car-Sharing has been offered since 1987. The first German survey participant started up in 1990. In Germany, a groundswell of many Car-Sharing providers in large cities followed in 1992, but even a few smaller providers began their services at this early time. The first providers that responded to the survey from a European country without a momo partner organisation began their Car-Sharing projects in 1998. In Italy, the first services were implemented in 2001. The start-ups continued up until very recently so that some responding Car-Sharing providers still have relatively little experience.

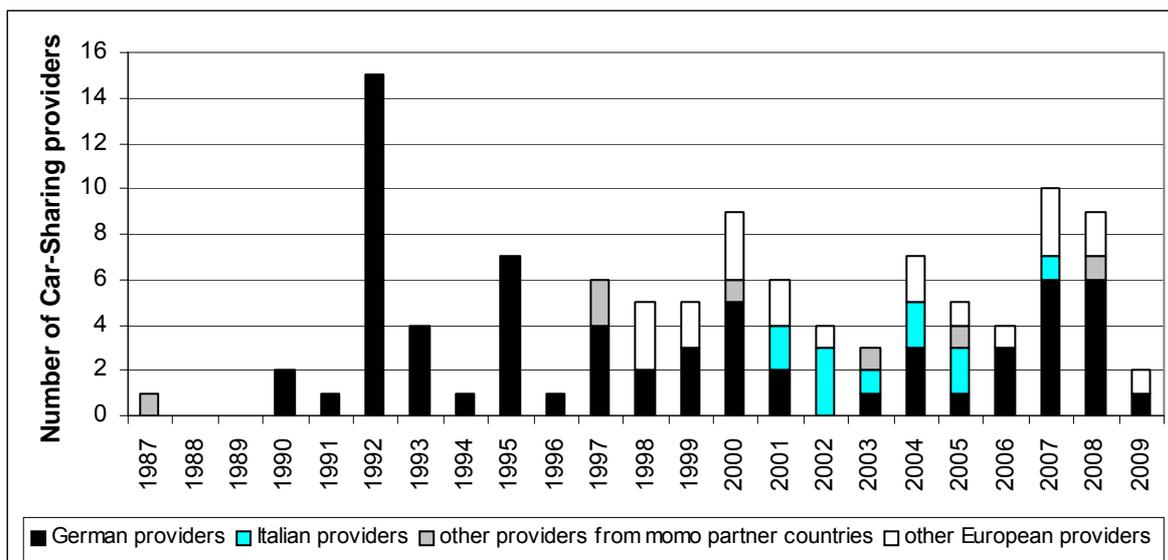


Fig. 3.1: Start year of responding Car-Sharing providers (n = 107)

Number of Car-Sharing users

Overall, at the time of the survey in early 2009, the responding Car-Sharing providers had almost 220,000 registered customers or users. That is 58% of the estimated number of Car-Sharing users for all of Europe. As Figure 3.2 shows, these users are distributed very differently among the individual providers. The small providers (fewer than 100 users) both in Germany and in the European countries without a momo partner, make up the largest group numerically. In the momo partner countries (except Germany), the mid-size providers (1,000 to 5,000 users) are the most common.

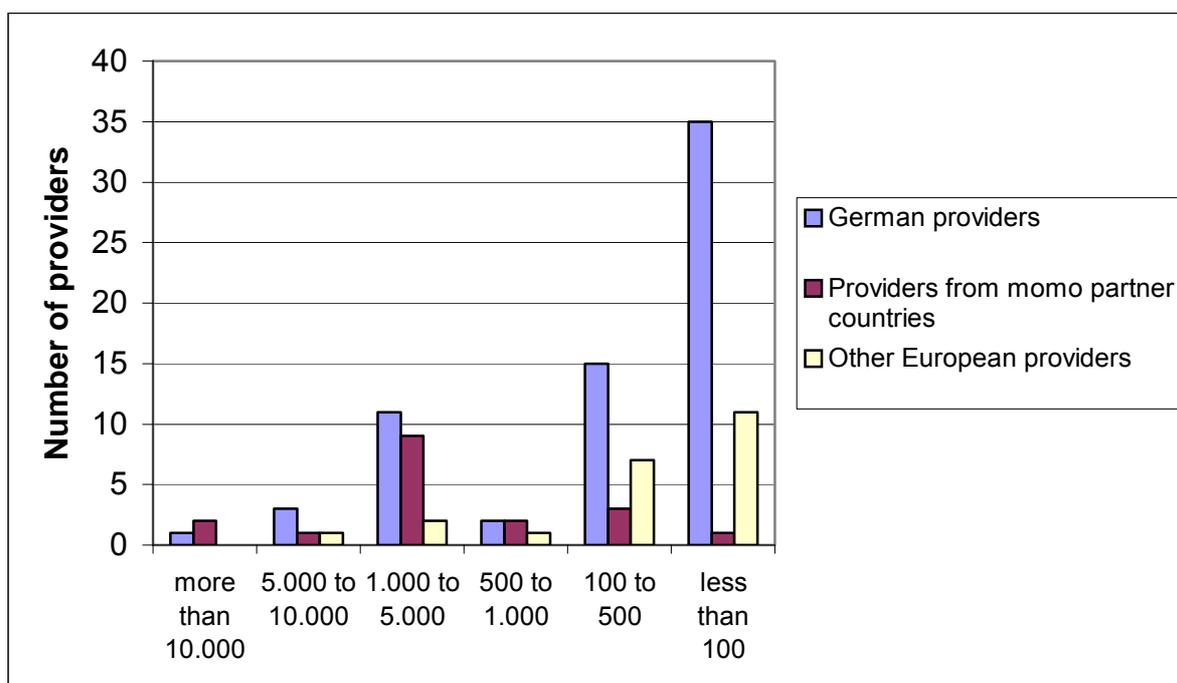


Fig. 3.2: Number of responding Car-Sharing providers by number of users (n = 107)

For many Car-Sharing providers, a distinction must be drawn between the number of customers/members with whom contracts have been signed and the number of authorised users. This can be explained by the fact that in many cases, although a contract has been signed with one customer, it also authorises use by other members of the family or household. On average, 1.1 people per private customer contract are authorised users. For smaller providers, this number increases to an average of 1.2 authorised users (see Table 3.3).

	all Car-Sharing providers (n = 80)	larger Car-Sharing providers (n = 21)	smaller Car-Sharing providers (n = 59)
Number of authorised users per private customer contract	1.11	1.11	1.21

Table 3.3: Authorised users per private customer contract

The same difference between contracts and authorised users is also seen for business customers where the relationship between the number of contracts and authorised users is approximately three times higher in comparison to private customers. This is understandable since a contract with a business customer has an explicit goal that all employees of a company, administration or organisation have access to Car-Sharing vehicles for their business travel. On the other hand, the relatively small number of users per contract shows that predominantly smaller business customers show up in the analysis. It should, however, be noted that only about half of the responding Car-Sharing providers answered this question.

	all Car-Sharing providers (n = 51)	larger Car-Sharing providers (n = 21)	smaller Car-Sharing providers (n = 30)
Number of authorised users per business customer contract	3.32	3.29	3.96

Table 3.4: Authorised users per business customer contract

One last analysis of the Car-Sharing users concerns the relationship between the number of private and business customers for the providers. For providers overall, 93% of contracts were signed with private customers and 7% with business customers. The smaller Car-Sharing providers (fewer than 500 customers) exhibit a decidedly higher rate with 10.5% business customers. Based on the number of authorised users, the relationship leans distinctly in favour of business customers: 16% of authorised Car-Sharing customers use Car-Sharing vehicles as business customers, as opposed to only 84% private users. In turn, smaller providers show a distinctly higher number in favour of business customers: 27% authorised business users as opposed to 73% private authorised users.

	all Car-Sharing providers	larger Car-Sharing providers	smaller Car-Sharing providers
Number of contracts, private customers and business customers	Private customers = 93.3% Business customers = 6.7% (n = 57)	Private customers = 93.4% Business customers = 6.6% (n = 23)	Private customers = 89.5% Business customers = 10.5% (n = 34)
Number of authorised users, private customers and business customers	Private customers = 84.3% Business customers = 15.7% (n = 58)	Private customers = 84.7% Business customers = 15.3% (n = 21)	Private customers = 72.7% Business customers = 27.3% (n = 37)

Table 3.5: Proportion of contracts and authorised users – private and business customers

Car-Sharing stations

On a designated day, the responding Car-Sharing providers had a total of 6,463 Car-Sharing vehicles in service at 3,312 stations. This shows a relationship over all providers of 1.92 vehicles per Car-Sharing station. The smaller providers (up to 20 vehicles) indicate decidedly lower vehicles availability per station at 1.31 (see Table 3.6). The larger providers organise their vehicle availability per station in part as a targeted promotional offer, whereas the smaller providers are often not able to exploit this marketing tool because of tighter funding situations. The more multifaceted the vehicle selection at a station, the larger the customers' flexibility with regard to time availability or selection of vehicle models.

There are, however, some larger providers that consciously offer a larger number of one-vehicle stations so as to achieve a wide geographical coverage. Another approach in station development has been implemented by the Finnish Car-Sharing provider, which has substantially more stations than Car-Sharing vehicles. The individual stations are thus not always occupied by a vehicle. They make up for this by moving vehicles around among the stations based on customer needs.

	all Car-Sharing providers (n = 106)	larger Car-Sharing providers (n = 39)	smaller Car-Sharing providers (n = 67)
Number of Car-Sharing vehicles per station	1.92	1.98	1.31

Table 3.6: Average number of Car-Sharing vehicles at stations

Car-Sharing vehicles

The Car-Sharing providers were then asked if they had any vehicles in their fleets with particularly environmentally-friendly drive system technology, i.e. not normal petrol or diesel engines with EURO 4 or EURO 5 emission standards.

47 providers answered “yes.” 9% of the vehicles of these providers show a particularly environmentally-friendly drive system. Assuming that not only those who answered “no” but also those who didn’t answer the question at all have no vehicles in their fleets with environmentally-friendly drive systems, the number of “eco-vehicles” drops to just 4% of all responding providers.

Astonishingly, the smaller providers (20 vehicles or fewer) – at 22% – had a significantly higher number of environmentally-friendly vehicles in their fleets than the larger providers, for whom the number was only 8%. From the survey, it cannot be determined whether a higher environmental consciousness, greater keenness to experiment or physical proximity to the necessary filling or charging station is the cause for the decidedly larger number of environmentally-friendly vehicles among smaller providers. A further surprising detail is that all four electric vehicles in the analysis were procured by smaller providers.

The results are presented in detail in Table 3.7.

In brackets: proportion of provider’s total fleet	all Car-Sharing providers (n = 47)	larger Car-Sharing providers (n = 23)	smaller Car-Sharing providers (n = 24)
Number of vehicles with compressed natural gas drive systems	163 (6.0%)	149 (5.8%)	14 (8.1%)
Number of vehicles with liquid natural gas drive systems	30 (1.1%)	17 (0.7%)	13 (7.6%)
Number of vehicles with hybrid drive systems	37 (1.4%)	33 (1.3%)	4 (2.3%)
Number of vehicles with electric drive systems	4 (0.1%)	0 (0.0%)	4 (2.3%)
Number of vehicles with other drive systems (natural gas, ethanol)	13 (0.5%)	10 (0.4%)	3 (1.7%)
Total number of vehicles with more environmentally friendly drive systems	247 (9.0%)	209 (8.2%)	38 (22.1%)

Table 3.7: Car-Sharing vehicles with more environmentally friendly drive technology

The following two diagrams reflect the survey results with regard to specific CO₂ emissions of Car-Sharing fleets. Both the average CO₂ emissions of the total Car-Sharing fleet of a provider was requested as well as the specific CO₂ emissions of only the light duty vehicles

(measured in g CO₂/km). In the diagrams, the results are differentiated according to calculated data from the providers and those that are only estimates. The estimates should certainly be regarded with more caution than the calculated data.

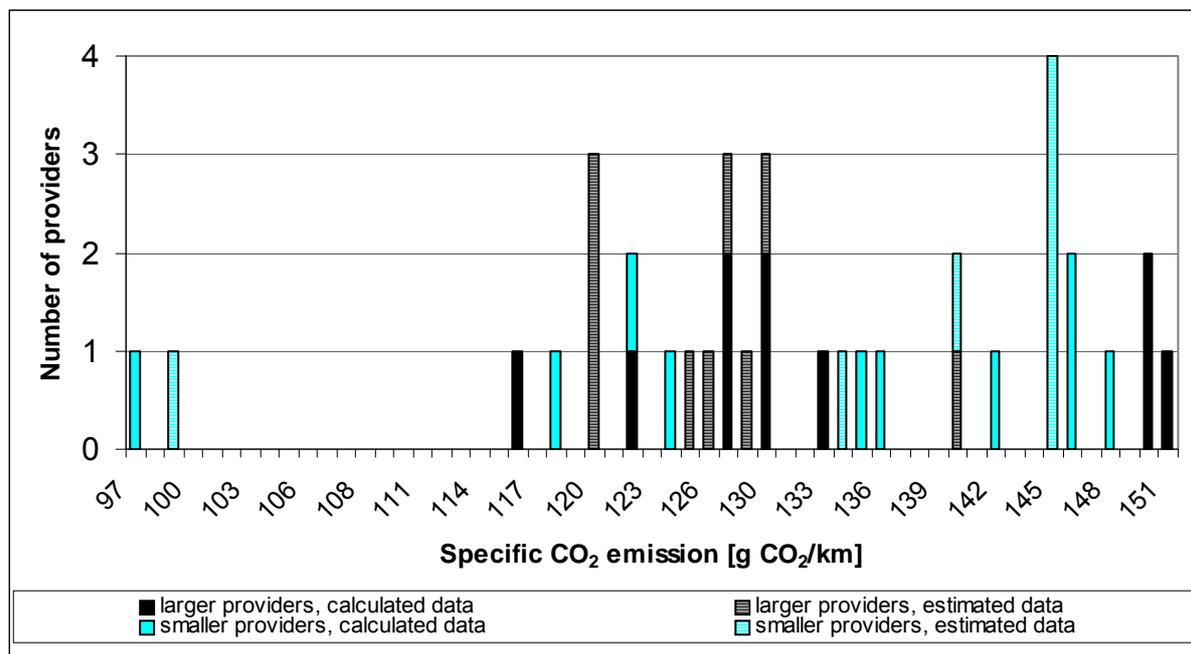


Fig. 3.3: Specific CO₂ emission of the Car-Sharing fleet (n = 36)

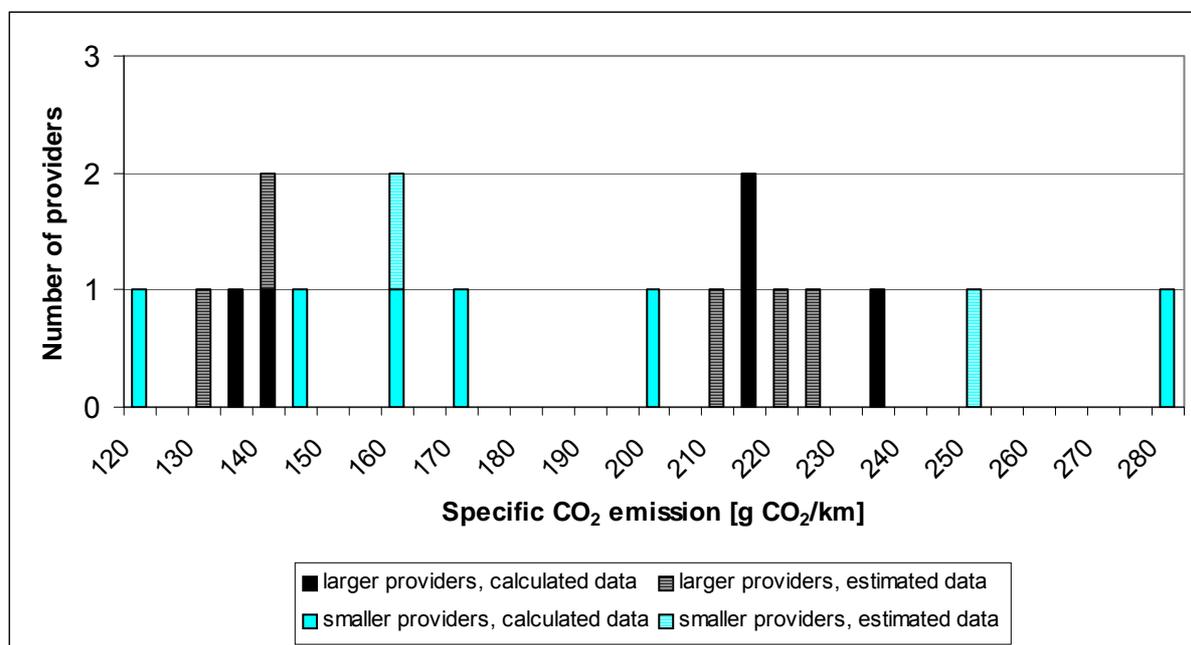


Fig. 3.4: Specific CO₂ emission of light-duty vehicles in the Car-Sharing fleet (n = 18)

The average specific CO₂ emissions for the larger providers (more than 20 vehicles), weighted by the number of vehicles, is 141.9 g CO₂/km (n = 10). Only those providers whose data were calculated from the fleet statistics were taken into account. This relatively high

specific emission is significantly influenced by the Swiss provider Mobility, who maintains a relatively high number of vehicles with larger engines in its fleet for its business customers. If the Mobility vehicles are taken out of the calculation, a specific CO₂ emission value of 129.6 g CO₂/km (n = 9) would result. This number is relatively close to the value of the smaller providers (up to 20 vehicles), who show a specific CO₂ emission of 128.1 g CO₂/km (n = 10).

With this, those Car-Sharing providers who calculated the average CO₂ emissions of their existing fleet are already very close to meeting the EU standard which European car manufacturers will have to meet for their new cars as from 2015. It should be noted here that the Car-Sharing providers' calculations included not only the new cars but also the vehicles that have been in their fleets for a longer time.

No comparable averaging could be carried out on the light duty vehicles and the minibuses maintained in the Car-Sharing fleets as current numbers were not requested and thus no weighting of the data could be carried out based on number of vehicles.

Spatial distribution of Car-Sharing users

The experience of many providers shows that the spatial distribution of Car-Sharing users in urban areas follows a typical distribution pattern, which appears to be broadly independent of specific cities. According to the pattern, a large proportion of private Car-Sharing users live in densely-built neighbourhoods close to the city centre. The wide-ranging mix of different uses (living, shopping, small business and services) creates a high level of urbanity in these neighbourhoods and imparts to its inhabitants a particular urban vitality. These neighbourhoods generally have good public transport services and are easy to reach by bicycle. On the other hand, the pressure on parking space for personal vehicles is often particularly high here.

In order to check whether the Car-Sharing providers polled in our study show similar customer distribution patterns, the question of distribution of private and business customers in urban areas was asked. The division among the following four metropolitan areas was entirely predictable: 1. city centre, 2. densely-built neighbourhoods near the city centre, 3. neighbourhoods somewhat farther from the city centre and 4. peripheral neighbourhoods. Nonetheless, it could not be established in all cases that each respondent had the same conception of the physical locations of the area. The data also rely more on estimates than on statistically drawn conclusions.

Based on all responding Car-Sharing providers, one third of private customers live in the centre of their city, a further half in densely-built neighbourhoods surrounding the city centre. 12% of private customers are located in more distant neighbourhoods in which large numbers of social housing units are often located. Only 5% of private customers come from peripheral neighbourhoods, those that often have larger numbers of tree-filled residential estates with detached single family homes. These results of our survey are comparable with other scientific studies of the spatial distribution of Car-Sharing users. They are not the outcome of opportunity-driven station development on the part of the providers but rather are based on the mobility orientation and preferences of the typical inhabitant of this type of urban space.

The differences between larger and smaller providers are explained by the fact that smaller providers are generally found in smaller cities in which the proportion of inhabitants in the city centre is larger still and densely-built neighbourhoods near the city centre do not as clearly possess the qualities of urbanity.

In principle, a similar physical distribution pattern exists among business Car-Sharing users, as Figure 3.5 shows. This supports the observation that the business customers of the responding Car-Sharing providers are predominantly smaller companies or organisations, which can also be concluded from the number of 3.3 authorised users per business customer (see Table 3.4). Smaller agencies and service providers likewise prefer to locate in mixed-use neighbourhoods close to the city centre. This indicates that, so far, the main points of origin for both private and business Car-Sharing customers are the same, but with the expansion of the Car-Sharing idea in larger firms that is already taking place, this may change with time.

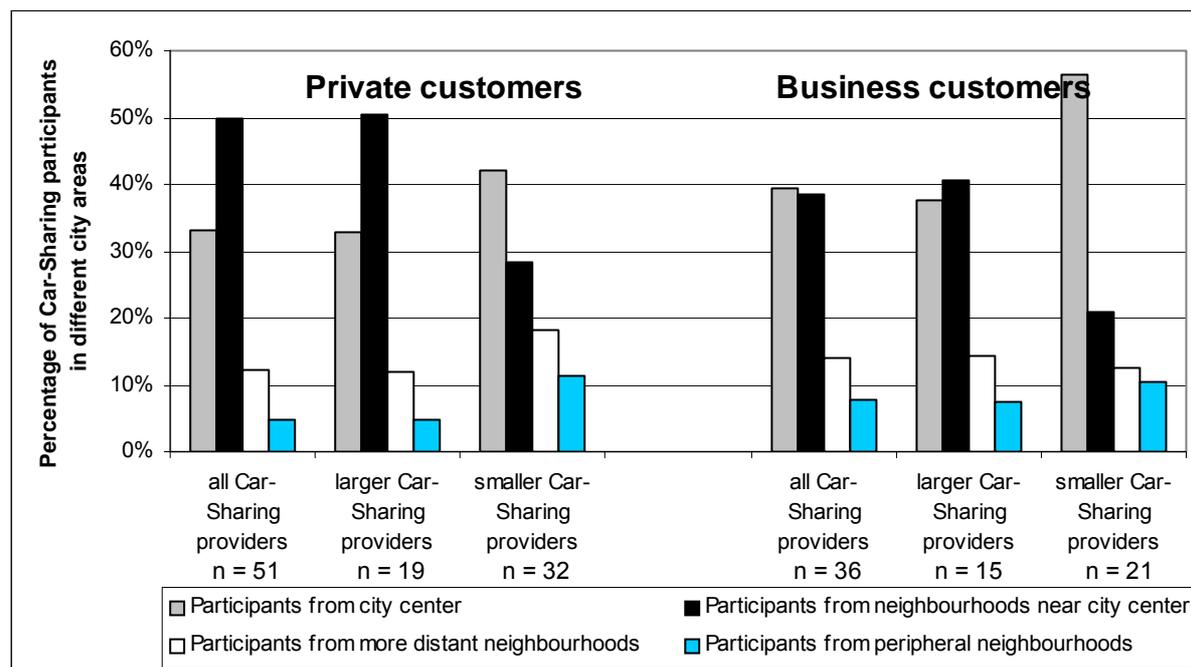


Fig. 3.5: Spatial distribution of Car-Sharing users in metropolitan areas

Disposal of private cars

In question A.11, the Car-Sharing providers were asked whether they had any information about how many customers got rid of a private car or decided against a new car purchase because of their Car-Sharing participation. 34 providers responded that they had such information from a range of different sources.

The data are based both on routinely collected information upon the registration of new customers as well as on personal conversations with new customers or members (with the personal conversations applying more to smaller providers). Some of the data were also obtained through scientific research and customer surveys which, in some cases, took place several years earlier.

The survey results that follow cannot therefore be taken as scientifically verified findings, but rather as evidence that a considerable number of private cars are rendered unnecessary through Car-Sharing use and are disposed of by their owners. It wasn't seen as relevant, and therefore was not asked, whether the vehicles that were disposed of were the only vehicle in the household of the Car-Sharing participants or a second or even third vehicle.

If we assume that each Car-Sharing user reported on in this question got rid of at least one car or decided against a planned purchase of one, the customers of the 34 responding Car-Sharing providers have removed more than 13,800 cars from the road. According to the responses received, this was the case for a good quarter of Car-Sharing customers. If the number of personal vehicles disposed of or not bought is compared with the number of vehicles introduced into the Car-Sharing fleets, on average, each Car-Sharing vehicle would take the place of seven personal vehicles disposed of or not bought. The smaller providers have a significantly lower value of 1.9 personal vehicles disposed of for each Car-Sharing vehicle.

	all Car-Sharing providers (n = 34)	larger Car-Sharing providers (n = 11)	smaller Car-Sharing providers (n = 23)
Number of Car-Sharing customers who have got rid of private cars or decided against a planned new purchase	13,815	13,546	269
Proportion of all customers of this provider	27.3%	27.7%	15.6%
Ratio of vehicles that were disposed of or that were not acquired to vehicles in Car-Sharing fleet	7.0 to 1	7.3 to 1	1.9 to 1

Table 3.8: Personal vehicles disposed of or not acquired by Car-Sharing customers

Data on Car-Sharing use

The five questions whose results are presented in the following table were only asked of the Car-Sharing providers in the momo partner countries. The responses of the Car-Sharing providers were weighted based on the number of vehicles in their fleets.

The larger Car-Sharing providers (more than 20 vehicles) have an average annual vehicle use of their Car-Sharing vehicles of 23,510 km. The smaller providers, in contrast, have only 13,658 km. This shows that larger providers are able to make significantly more efficient use of their vehicles.

	all Car-Sharing providers (n = 51)	larger Car-Sharing providers (n = 22)	smaller Car-Sharing providers (n = 29)
km per Car-Sharing vehicle of responding Car-Sharing providers	23,158	23,510	13,658

Table 3.9: Average annual kilometres driven in Car-Sharing vehicles in 2008

Car-Sharing vehicles are, on average, reserved by customers for one quarter of each day. Here too, the vehicles of larger providers are exploited to better advantage (28.8% of the day) than those of smaller providers (22.6%). Nonetheless, the difference between the two is significantly smaller than that between Car-Sharing vehicles and the average car.

	all Car-Sharing providers (n = 48)	larger Car-Sharing providers (n = 25)	smaller Car-Sharing providers (n = 23)
Proportion of time (in % of 24 hours) that Car-Sharing vehicles are used daily	25.9%	28.8%	22.6%

Table 3.10: Use of Car-Sharing vehicles in 2008 (by time)

In a further question, the annual number of bookings per private customer and per business customer was asked. This shows that the smaller providers (fewer than 500 Car-Sharing users) have a higher average number of bookings per private customer (19.7 bookings per customer per year) than the larger providers (15.1 bookings).

The analysis of the annual bookings per business customer is not presented as it appears the question was not answered correctly by many respondents and the margin of error was seen as too high.

	all Car-Sharing providers (n = 36)	larger Car-Sharing providers (n = 16)	smaller Car-Sharing providers (n = 20)
Average number of bookings by private customers	15.2	15.1	19.7

Table 3.11: Number of bookings by private customers

In 2008, the annual distance driven per private customer was 737 km for all providers. This result was determined largely by the above-mentioned weighting of the customers of the larger providers. In contrast, the smaller providers (fewer than 500 users) show considerably higher vehicle use with an average of 1,159 annual kilometres. The average annual kilometres driven per business customer show numbers approximately 2.5 times higher with the average business customer driving 1,868 kilometres in Car-Sharing vehicles in 2008. It should be noted that the calculations were done based on the number of contracted users, as opposed to the number of authorised users. The smaller providers also have a significantly higher average number of annual kilometres per customer for business customers.

	all Car-Sharing providers	larger Car-Sharing providers	smaller Car-Sharing providers
Weighted average annual kms driven per private customer in 2008	737 (n = 31)	732 (n = 13)	1,159 (n = 18)
Weighted average annual kms driven per business customer in 2008	1,868 (n = 20)	1,837 (n = 8)	2,868 (n = 12)

Table 3.12: Annual driving time for private and business customer in 2008

The last question in this area concerned the average length of each reservation. For private customers, the average length of use was 8.5 hours; for business customers, it was somewhat shorter at 7.6 hours. Nonetheless, it should be noted that only a relatively small number of providers answered this question. Based on other experience, this number appears relatively high.

	all Car-Sharing providers	larger Car-Sharing providers	smaller Car-Sharing providers
Average use time per private customer [in hours]	8.5 (n = 29)	9.5 (n = 13)	7.6 (n = 16)
Average use time per business customer [in hours]	7.6 (n = 19)	8.9 (n = 7)	6.9 (n = 12)

Table 3.13: Average vehicle use time in 2008

Questions A.13.1 to A.13.3 about the specific target groups of Car-Sharing providers were not answered as expected by most respondents. We assume from the responses that the understanding of “target group” among many respondents was not very refined or that the question was entirely misinterpreted. Thus we will forego an analysis of this question.

3.3.2 Findings on the collaborative activities of Car-Sharing providers

The second part of the questionnaire was concerned with the collaborative activities entered into by many Car-Sharing providers with other transport companies.

Collaborative activities with local public transport companies

The collaborative activities undertaken with companies that organise local public transport in cities or in the surroundings of cities play the largest role. Here, three different participants are distinguished: 1. the public transport companies that run local public transport in cities, 2. the transport companies that run bus or train service into the surrounding regions, and 3. the local public transport authorities or transport associations that are often responsible for fare policies of larger regions.

One third of the responding Car-Sharing providers had collaborative activities with a local transport company. The larger providers have established significantly more agreements for

collaborative activities: at two thirds, the number of collaborating Car-Sharing providers is twice as high as for smaller providers.

	all Car-Sharing providers (n = 108)	larger Car-Sharing providers (n = 35)	smaller Car-Sharing providers (n = 73)
Collaborative activities with local public transport companies agreed to (contractually or informally)	37 Car-Sharing providers (34.3%)	23 Car-Sharing providers (65.7%)	14 Car-Sharing providers (19.2%)

Table 3.14: Collaborative activities with local public transport companies

Components of the collaborative activities with local transport companies are (in order of frequency of response):

- Reduced rates and special sign-up conditions for regular public transport customers,
- Joint advertising and publicity to the benefit of Car-Sharing,
- Shared marketing,
- Shared channels to bring in new Car-Sharing customers,
- Shared information booths,
- Car-Sharing parking spots provided on transport company land,
- Regular communication to public transport customers on Car-Sharing,
- Car-Sharing provider is part of the transport company,
- Free parking at railway stations,
- Reduced Car-Sharing rates for employees of the transport company,
- Car-Sharing information in local public transport route maps and at stops,
- Shared electronic access card.

The collaborative activities are seen by the Car-Sharing provider foremost as a tool to raise the level of public awareness of Car-Sharing services. On average, the significance of the collaborative activities is seen by both larger and smaller providers as important (rated as 2.24 on a scale of 1 = very important to 5 = not important). At 2.37, the significance of the collaborative activities for growth in customer numbers in Car-Sharing is slightly weaker, whereby the larger providers gave a somewhat higher rating. The state of the collaborative activities was nonetheless rated as average or satisfactory (rating of all respondents: 2.76). Thus, there is, from the perspective of the Car-Sharing providers, potential for improvement.

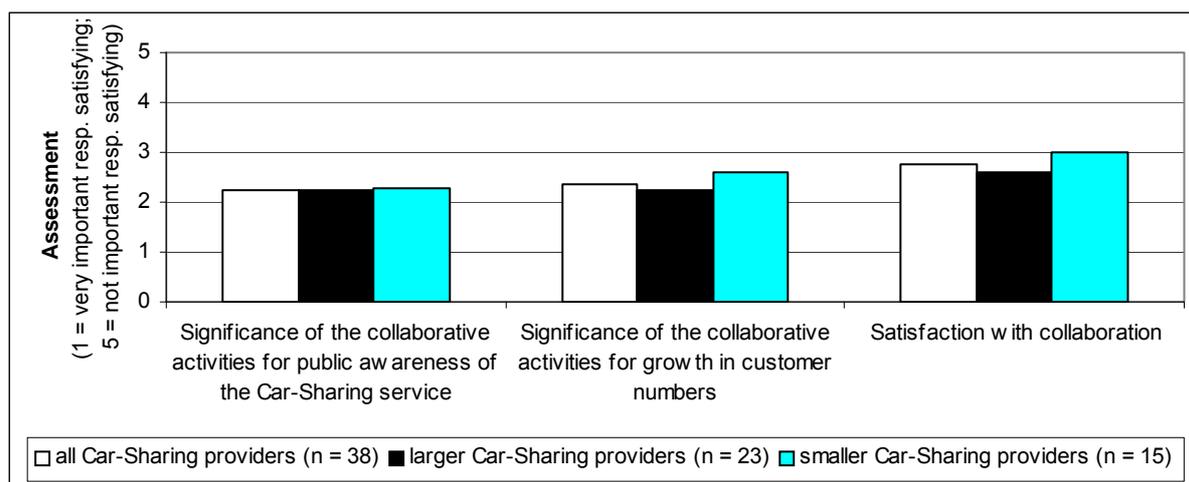


Fig. 3.6: Assessment of the collaborative activities with local public transport companies

Significantly fewer providers reported experience collaborating with regional transport companies. Here, only one quarter of the larger Car-Sharing operators had either a contractual or an informal agreement with a regional transport company. For the smaller providers, it was only 5%.

	all Car-Sharing providers (n = 108)	larger Car-Sharing providers (n = 35)	smaller Car-Sharing providers (n = 73)
Collaborative activities with regional public transport companies agreed to (contractually or informally)	13 Car-Sharing providers (12.0%)	9 Car-Sharing providers (25.7%)	4 Car-Sharing providers (5.5%)

Table 3.15: Collaborative activities with regional public transport companies

Components of the collaborative activities with regional transport companies are (in order of frequency of response):

- Reduced rates,
- Joint marketing,
- Transport company supports advertising for Car-Sharing,
- Collaboration in public transport ticket sales,
- Communication about Car-Sharing,
- Regional transport company is part owner of the Car-Sharing provider.

In comparison to the local transport companies, overall, the assessment of the significance of the collaborative activities with regional transport companies appears to be more cautious. This is probably because the smaller Car-Sharing providers provide a decidedly less favourable assessment of collaborative activities both with regard to public awareness and

growth in customer numbers. The larger Car-Sharing providers involved in collaborative activities with a transport company at a regional level rate them even more positively than those with a local transport company. Here, too, a somewhat higher level of satisfaction with the state of the collaborative activities can be seen in comparison to activities at the local level.

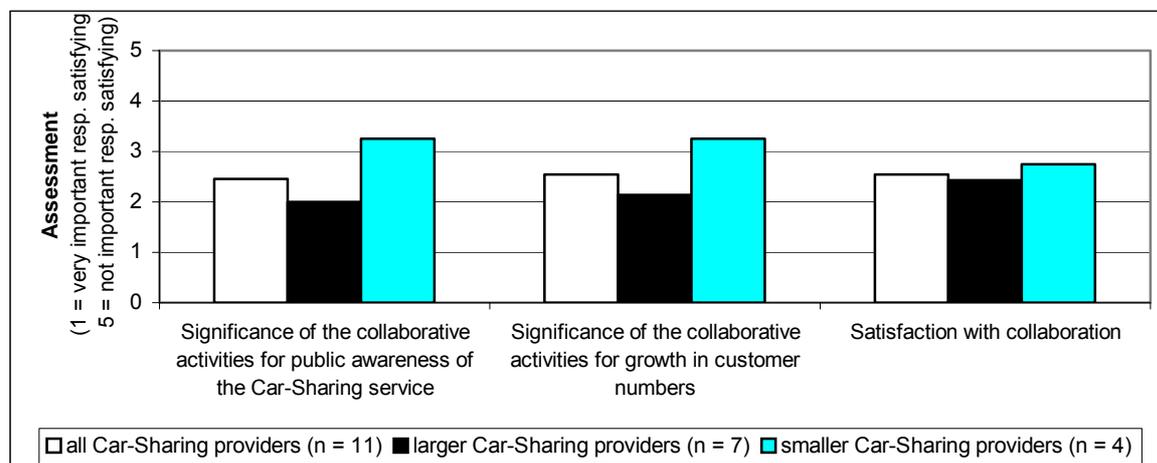


Fig. 3.7: Assessment of collaborative activities with regional public transport companies

Half of the larger Car-Sharing providers have entered into collaborative activities with a local **public transport authority or a transport association**. For the smaller providers, it is only 11%.

	all Car-Sharing providers (n = 108)	larger Car-Sharing providers (n = 35)	smaller Car-Sharing providers (n = 73)
Collaborative activities with public transport authorities or the regional public transport association agreed to (contractually or informally)	26 Car-Sharing providers (24.1%)	18 Car-Sharing providers (51.4%)	8 Car-Sharing providers (11.0%)

Table 3.16: Collaborative activities with local public transport authorities or regional public transport associations

Components of collaborative activities with local public transport authorities or transport associations are (in order of frequency of response):

- Reduced rates for regular customers of local public transport,
- Collaboration in advertising activities,
- Shared marketing,

- Collaboration in ticket sales, signing up of new Car-Sharing customers at mobility centres,
- Car-Sharing parking spaces are shown on public transport stop maps,
- Collaboration with local public transport companies' call centres,
- Car-Sharing providers receive (time limited) financial support through local public transport authorities,
- Shared means of electronic access,
- Reduced local public transport rates for Car-Sharing customers,
- Public transport authority is part owner of the Car-Sharing company.

At 2.67 over all providers, the collaborative activities for public awareness of Car-Sharing services is rated lower than the above-mentioned collaborative activities with local public transport. This is because of a lower rating by the larger providers. The collaborative activities for growth in customer numbers in Car-Sharing are rated higher by smaller providers for regional public transport associations than for local public transport companies. The larger providers rate this significance lower; the satisfaction with collaborative activities is average.

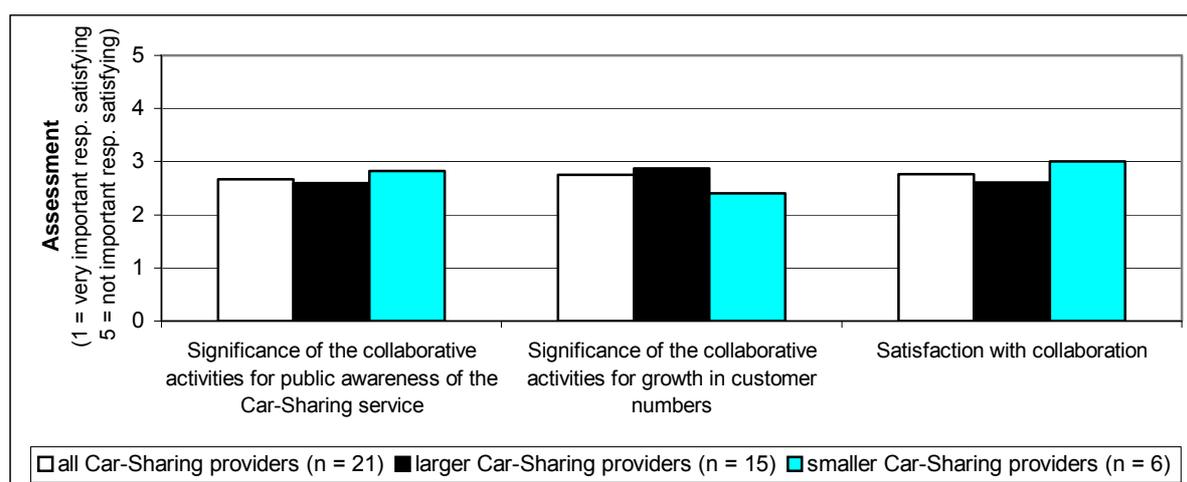


Fig. 3.8: Assessment of collaborative activities with local public transport authorities and regional public transport associations

Collaborative activities with bicycle providers

Only one fourth of larger Car-Sharing providers and just 5% of the smaller ones had established collaborative activities with a bicycle rental company or a bicycle provider.

	all Car-Sharing providers (n = 108)	larger Car-Sharing providers (n = 35)	smaller Car-Sharing providers (n = 73)
Collaborative activities with bicycle providers or bicycle rental companies agreed to (contractually or informally)	13 Car-Sharing providers (12.0%)	9 Car-Sharing providers (25.7%)	4 Car-Sharing providers (5.5%)

Table 3.17: Collaborative activities with bicycle providers or bicycle rental companies

Components of collaborative activities with bicycle providers or bicycle rental companies are (in order of frequency of response):

- Discounts for Car-Sharing customers,
- Reciprocal advertising activities,
- Information about Car-Sharing for customers in bicycle shops,
- Advantageous Car-Sharing sign-up conditions for bike shop customers,
- Special conditions for Car-Sharing customers at bike stations.

The significance of collaborative activities with bicycle providers with regard to public awareness is rated as average by the larger providers and less important by the smaller providers. The significance for growth in customer numbers is seen by all as less important.

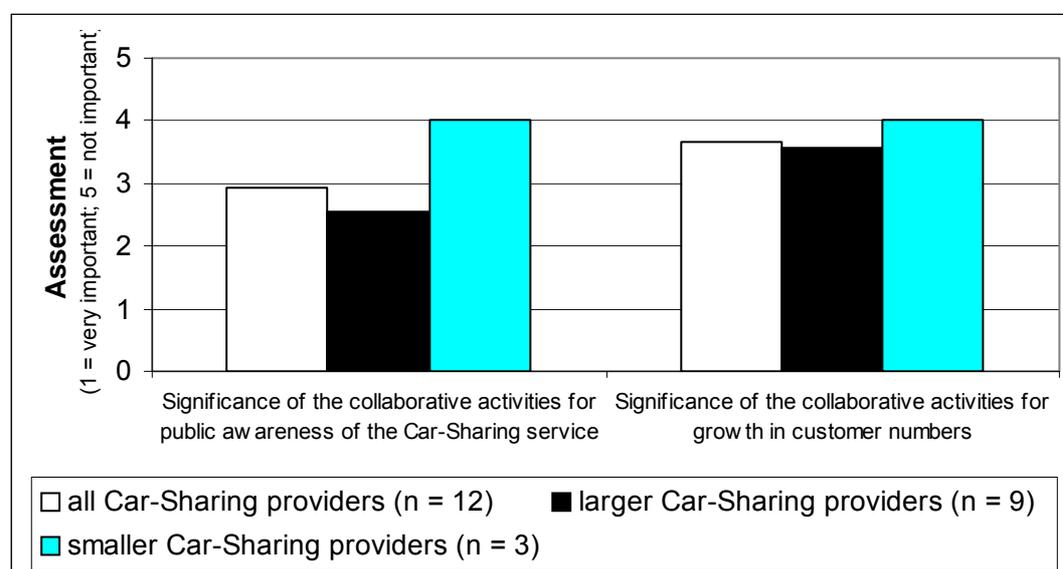


Fig. 3.9: Assessment of collaborative activities with bicycle providers or bicycle rental companies

Collaborative activities with taxi services

Only nine responding Car-Sharing providers had entered into an agreement with a local taxi service.

	all Car-Sharing providers (n = 108)	larger Car-Sharing providers (n = 35)	smaller Car-Sharing providers (n = 73)
Collaborative activities with local taxi service agreed to (contractually or informally)	9 Car-Sharing providers (8.3%)	6 Car-Sharing providers (17.1%)	3 Car-Sharing providers (4.1%)

Table 3.18: Collaborative activities with local taxi service

Components of the collaborative activities with local taxi services are (in order of frequency of response):

- Reduced taxi rates for Car-Sharing customers,
- Car-Sharing booking office (sometimes part time) at the taxi dispatch,
- Customer transfer by taxi in case of disruption,
- Cashless taxi travel,
- Car-Sharing advertising on taxis.

The significance of these collaborative activities is rated on average by all Car-Sharing players as between less important and not important both for public awareness and growth in customer numbers.

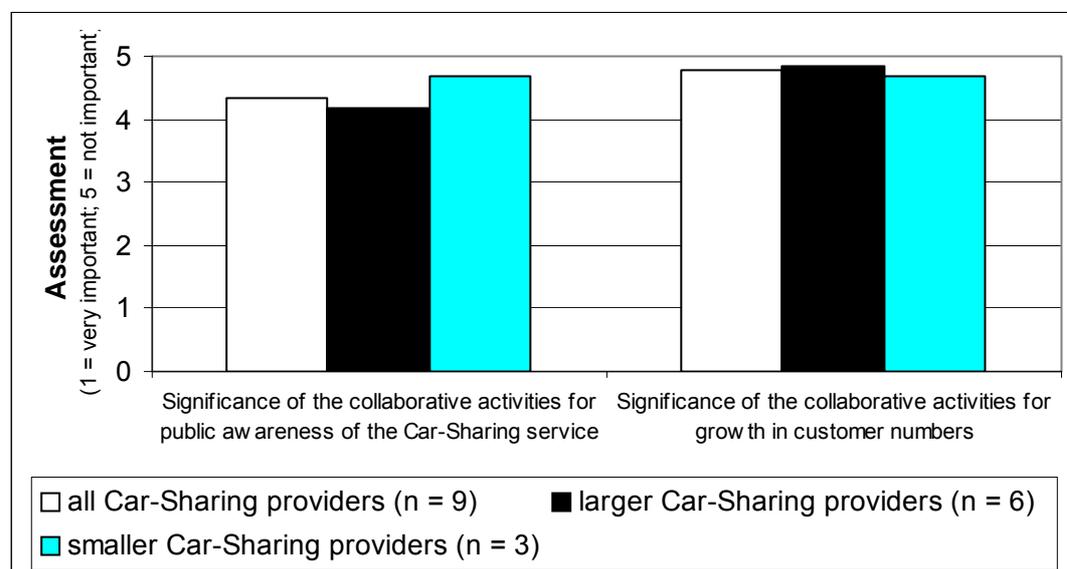


Fig. 3.10: Assessment of collaborative activities with local taxi services

Collaborative activities with car rental companies

The collaborative activities with car rental companies have major significance for the Car-Sharing providers. Almost one third of the responding providers have such collaborative activities, for the larger Car-Sharing companies, it's almost every second one.

	all Car-Sharing providers (n = 108)	larger Car-Sharing providers (n = 35)	smaller Car-Sharing providers (n = 73)
Collaborative activities with car rental companies agreed to (contractually or informally)	32 Car-Sharing providers (29.6%)	17 Car-Sharing providers (48.6%)	15 Car-Sharing providers (20.5%)

Table 3.19: Collaborative activities with car rental companies

Components of the collaborative activities with car rental companies are (in order of frequency of response):

- Reduced rates for Car-Sharing customers,
- Bridging capacity problems in Car-Sharing fleets,
- Longer journeys are taken in car rental company vehicles,
- Car-Sharing vehicles are leased from car rental companies,
- Loaning of small transport vehicles that aren't in the Car-Sharing fleet,
- One-way journeys with rental cars.

The significance of the collaborative activities for the public awareness of Car-Sharing providers is rated at 3.34, or average. The significance for customer growth is rated even lower at 3.62.

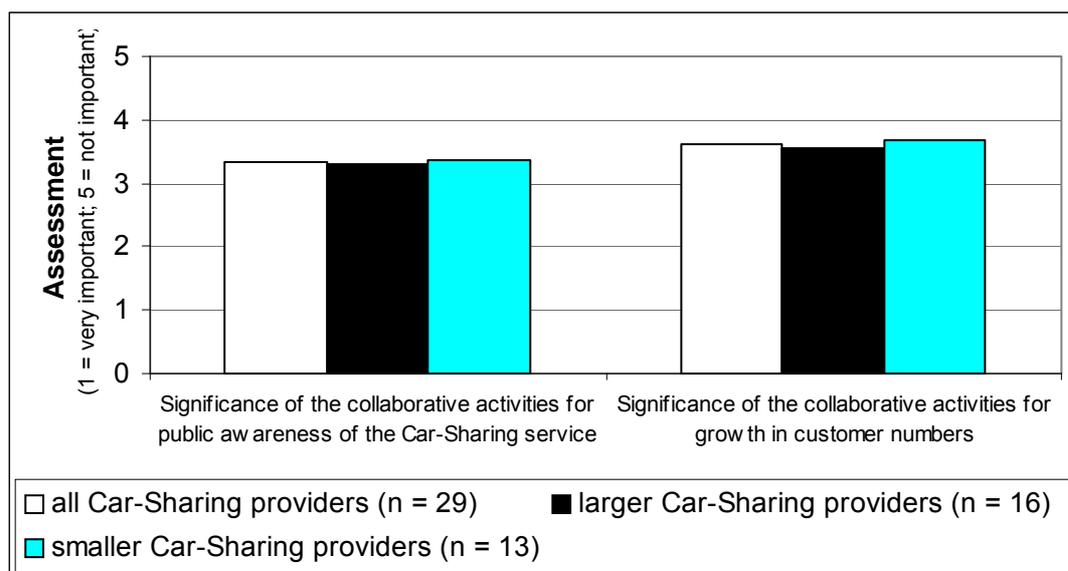


Fig. 3.11: Assessment of collaborative activities with car rental companies

Collaborative activities with car dealerships

Every fifth Car-Sharing provider had entered into collaborative activities with a car dealership, whereby one might question respondents as to how they distinguish between a normal business relationship for the purchase of cars and ongoing, continuing collaborative activities. The larger Car-Sharing providers see a larger need for collaborative activities; every fourth one has entered into such activities.

	all Car-Sharing providers (n = 108)	larger Car-Sharing providers (n = 35)	smaller Car-Sharing providers (n = 73)
Collaborative activities with car dealerships agreed to (contractually or informally)	20 Car-Sharing providers (18.5%)	9 Car-Sharing providers (25.7%)	11 Car-Sharing providers (15.1%)

Table 3.20: Collaborative activities with car dealerships

Components of collaborative activities with car dealerships – apart from the normal – are (in order of frequency of response):

- Special conditions for the acquisition of new cars,
- Leasing of vehicles,
- Accident replacement cars.

The significance of the collaborative activities with car dealerships varies starkly between the larger and smaller Car-Sharing providers. While the larger providers rate the significance as average, the smaller providers tend between less and not important.

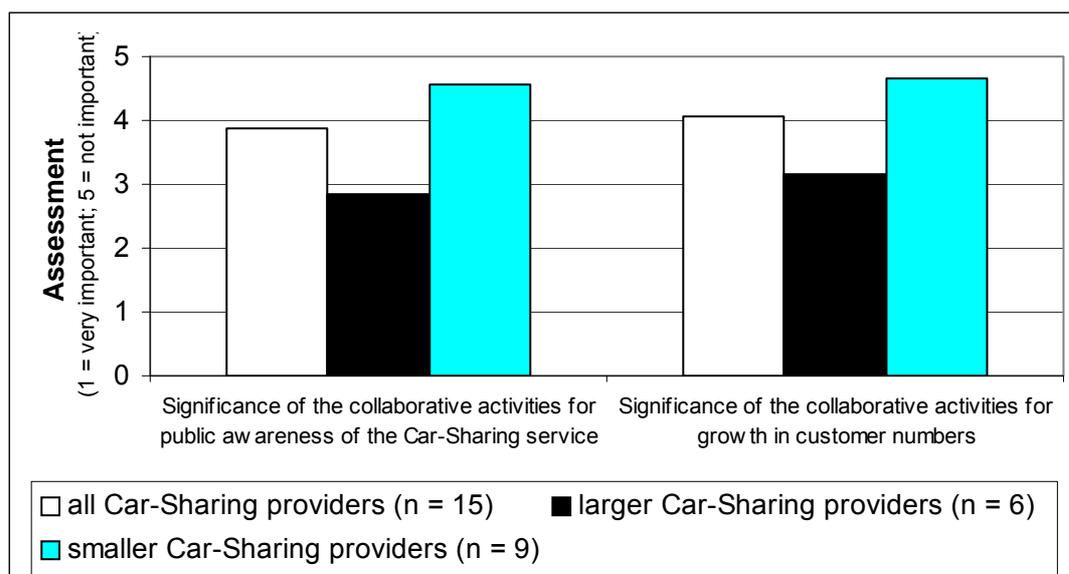


Fig. 3.12: Assessment of collaborative activities with car dealerships

Collaborative activities with car repair shops

There are large similarities between the responses with regard to car repair shops and to car dealerships with regard to the number of collaborative activities and the rating of their significance for public awareness and growth in customer numbers. In this respect, what is reported there applies here as well.

	all Car-Sharing providers (n = 108)	larger Car-Sharing providers (n = 35)	smaller Car-Sharing providers (n = 73)
Collaborative activities with car repair shops agreed to (contractually or informally)	22 Car-Sharing providers (20.3%)	11 Car-Sharing providers (31.4%)	11 Car-Sharing providers (15.1%)

Table 3.21: Collaborative activities with car repair shops

Components of collaborative activities with car repair shops are (in order of frequency of response):

- Special rates on repairs,
- Car-Sharing parking spaces on repair shop land,
- Discounts on labour costs for repair services,
- Repair shop itself reserves Car-Sharing vehicle to inspect and repair them, picks up and brings back the vehicles,
- Service contract,
- Repair shop loans Car-Sharing vehicles to its customers as replacement vehicles in case of accidents or longer repairs,

- Repair shop makes replacement vehicles available for longer repairs,
- Special terms on repairs (faster handling).

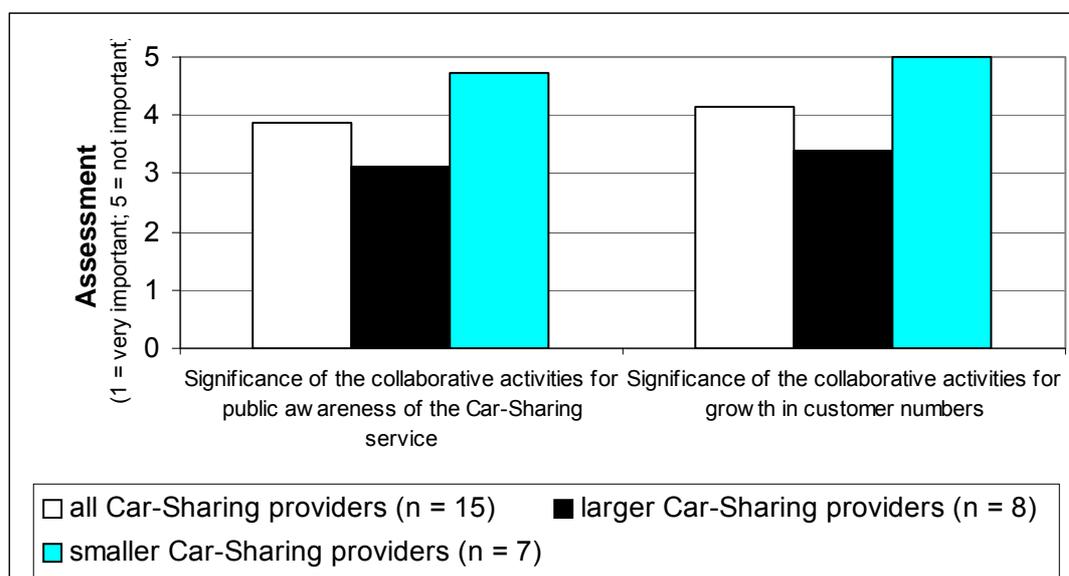


Fig. 3.13: Assessment of collaborative activities with car repair shops

Collaborative activities with car park companies

One third of larger Car-Sharing providers have collaborative activities with a car park company, whereas for the smaller providers, it's only 5%. Since it can probably be assumed that "larger providers" in this case also means "providers in larger cities," where private parking space is tight, the availability of space in car parks for Car-Sharing stations is one main reason for such collaborative activities.

	all Car-Sharing providers (n = 108)	larger Car-Sharing providers (n = 35)	smaller Car-Sharing providers (n = 73)
Collaborative activities with car park companies agreed to (contractually or informally)	15 Car-Sharing providers (13.9%)	11 Car-Sharing providers (31.4%)	4 Car-Sharing providers (5.5%)

Table 3.22: Collaborative activities with car park companies

Components of collaborative activities with car park companies are (in order of frequency of response):

- Rental of Car-Sharing parking spaces,
- Free rent for parking spaces if advertising stickers for the car park company are placed on Car-Sharing vehicles,

- Parking spaces for reduced rates,
- Free parking spaces in visible locations for Car-Sharing vehicles,
- Car park company imposes penalties for illegal parking in Car-Sharing provider's parking spaces.

The collaborative activities are seen both by the larger as well as the smaller providers as of average importance, whereby the significance for growth in customer numbers is rated marginally lower than that for public awareness.

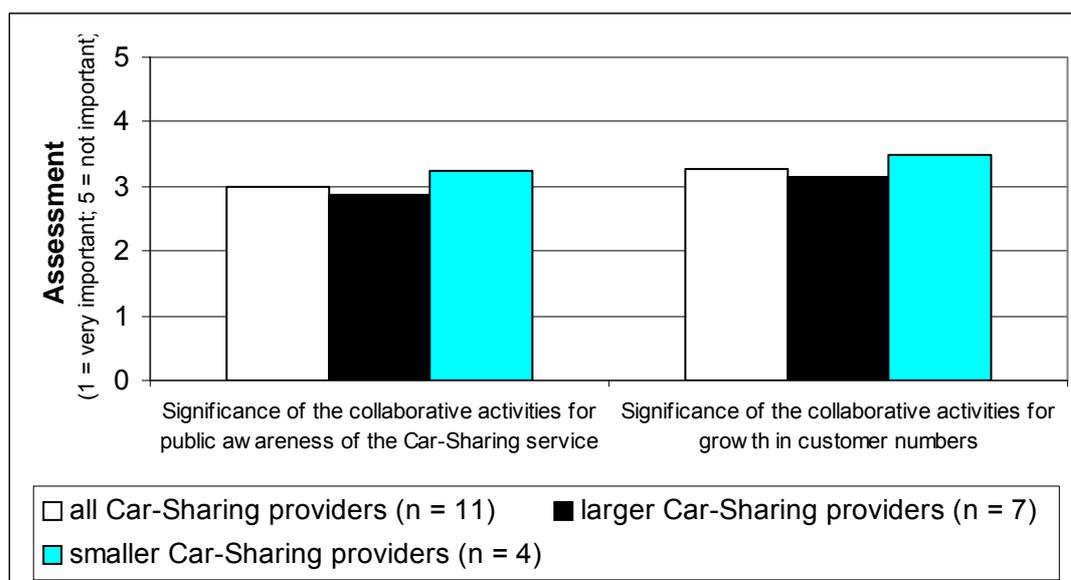


Fig. 3.14: Assessment of collaborative activities with car park companies

Collaborative activities with housing associations

Almost a third of larger providers have set up collaborative activities with a housing association, whereas this plays a marginal role among the smaller providers.

	all Car-Sharing providers (n = 108)	larger Car-Sharing providers (n = 35)	smaller Car-Sharing providers (n = 73)
Collaborative activities with housing associations agreed to (contractually or informally)	13 Car-Sharing providers (12.0%)	10 Car-Sharing providers (28.6%)	3 Car-Sharing providers (4.1%)

Table 3.23: Collaborative activities with housing associations

Components of collaborative activities with housing associations are (in order of frequency of response):

- Provision of Car-Sharing parking spaces on the association's land,
- Special conditions for Car-Sharing for tenants,
- Marketing collaboration, joint advertising,
- Publicity for Car-Sharing in internal publications,
- Special sign-up conditions for tenants.

It is astounding that the assessment of the significance of the collaborative activities with housing associations turned out to be worse among the larger providers than the smaller ones, although they enter into such collaborative activities significantly more often. All together, the significance rating is average.

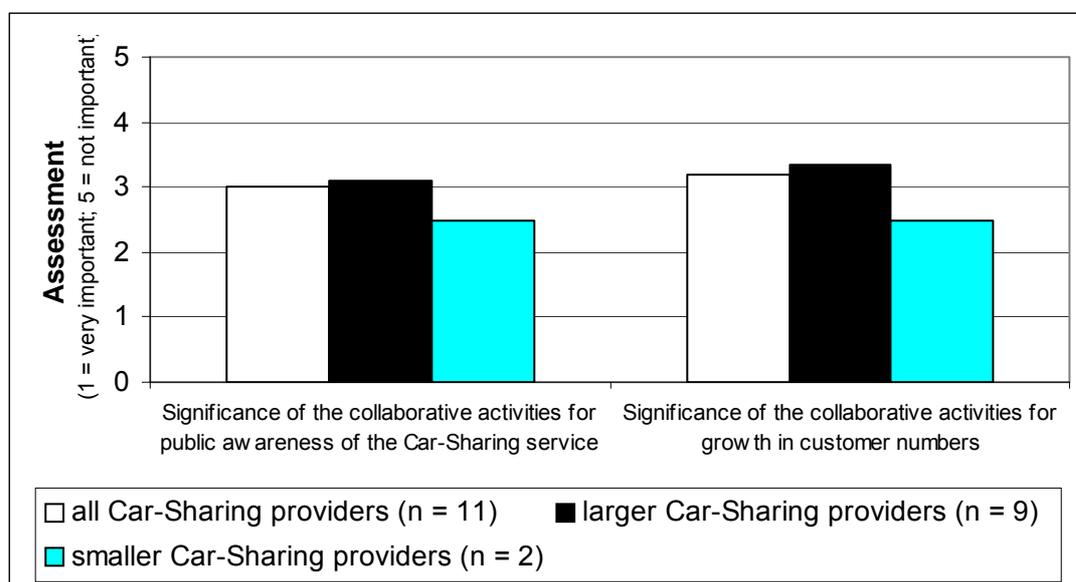


Fig. 3.15: Assessment of collaborative activities with housing associations

3.3.3 Findings on political support

In the third part of the questionnaire, the support that Car-Sharing providers receive from various political levels was examined.

National political and legal conditions

The responses regarding the political and legal conditions that support a successful Car-Sharing service at the national level are disappointing. On a scale of 1 = very good and 5 = poor, overall, Car-Sharing providers (n = 89) would rate the conditions as barely fair. A better rating was only given by the Car-Sharing providers in Belgium, Finland and Italy.

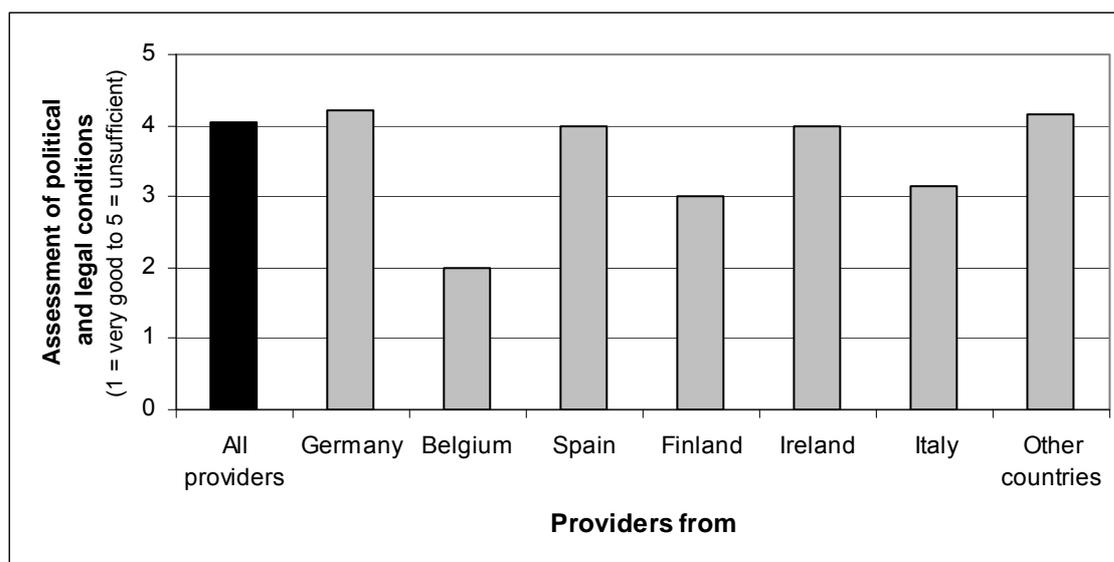


Fig.3.16: Assessment of national political and legal conditions for a successful Car-Sharing service

In response to the question of what national political and legal conditions have particularly helped the respondents in the development of their Car-Sharing services, the following responses were given (in order of frequency of response):

- Granting of financial start-up help from a national budget,
- Introduction of a national coordination point,
- The possibility to set up Car-Sharing parking spaces in public street space,
- Introduction of a national traffic sign for Car-Sharing providers or services,
- Introduction of a congestion charge,
- Introduction of low emission zones.

The responses of the Car-Sharing providers are provided here without further comment. An examination of supportive and inhibiting conditions will be undertaken in chapters 6 and 7.

To the question of which national political and legal conditions are seen as particularly in need of change, the following responses were given (in order of frequency of response):

- The possibility to set up Car-Sharing parking spaces in public street space,
- Car-Sharing recognised as a service that forwards the public good (and acknowledged with commensurate tax benefits),
- Better legal definition of Car-Sharing or, as the case may be, any legal regulation and support of Car-Sharing,
- A vehicle scrappage scheme which also benefits Car-Sharing services,
- Better communication about Car-Sharing,
- Stricter environmental laws and guidelines,
- Higher parking fees in general,
- Opening of priority lanes for Car-Sharing vehicles,

- Free parking for Car-Sharing vehicles,
- Better observation of environmental considerations in taxation laws,
- Loosening the requirement on Car-Sharing providers to check driving licences,
- General financial support for Car-Sharing services,
- Clear political commitment to Car-Sharing,
- Removal of the hidden subsidies for private and business use of cars.

Support at the local level

The support through local policy and/or through local government is seen as average or satisfactory. The larger providers rate the local support slightly better, although the differences are not very pronounced, as is shown in Figure 3.17.

Local support covers the following areas (in order of frequency of response):

- Car-Sharing parking spaces are made available on city land,
- Car-Sharing parking spaces are made available for a small rental fee,
- Local governments help to raise the level of awareness of Car-Sharing,
- City council is a business customer of Car-Sharing,
- Free parking spaces in city-owned car parks,
- Parking spaces in public street space made available through legal regulations,
- Project-based financial support,
- Key lockers are installed on city buildings,
- Inclusion of Car-Sharing services in local transport plans,
- Treatment of Car-Sharing services comparable with that of public transport,
- City council helps with lobbying work with regional bodies,
- Invitation through the city council to information presentations,
- City council mediates contact with potential partners,
- Permission for Car-Sharing vehicles to enter traffic limited areas (such as Low-Emission Zones),
- Wide-reaching political support.

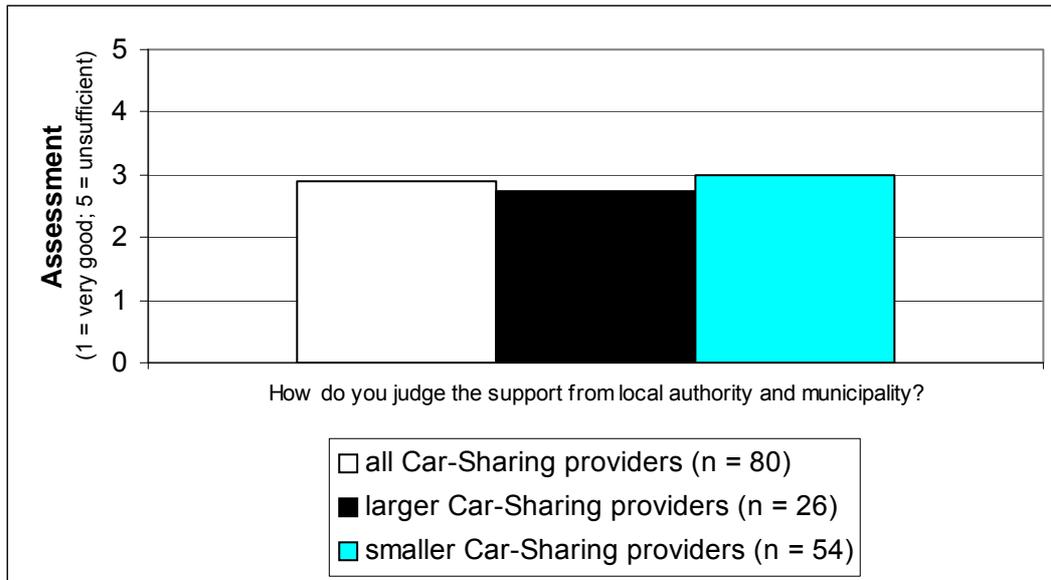


Fig. 3.17: Assessment of support through local policy or local administrations

4. The profile and motivation of Car-Sharing customers

This chapter is mainly concerned with the current Car-Sharing customers. How can they be described socio-demographically, what motivated them to become Car-Sharing members, which characteristics of Car-Sharing services do they most appreciate? These are a few of the customer-related questions that will be answered in a comparative examination of different providers and European countries.

This will include reporting on the results of several surveys carried out by the project partners in their respective countries at the beginning of the momo project.

Although there are many more studies and surveys on private Car-Sharing customers, a description of business customers is also provided insofar as information is available.

4.1 Current private customers

4.1.1 Socio-demographic characteristics of Car-Sharing participants

Gender

The majority of Car-Sharing customers are male. Table 4.1 shows a comparison of the gender distribution of private customers of different providers.

Car-Sharing provider or area	Proportion of male private customers	Proportion of female private customers	Source
cambio Brussels, Belgium	58%	42%	Taxistop, cambio 2009
Various providers, Italy	58%	42%	IME 2009
3 providers in London, Great Britain	69%	31%	Synovate 2006
Mobility, Switzerland	53%	47%	BfE 2006
2 providers in Frankfurt, Germany	63%	37%	traffiQ 2007
10 providers, Germany	58%	42%	Wuppertal Institute 2007

Table 4.1: Proportion of men and women among current private customers of various providers

Age

The majority of customers are between the ages of 26 and 49. Both those under 26 and those over 60 are conspicuously underrepresented. Here too, the different studies show clear consistencies, with deviation appearing in just one customer survey from London in 2006: there, 50% of Car-Sharing customers were between the ages of 25 and 34 (Synovate 2006). This is a markedly younger age distribution than in other studies.

Household size

One- and two-person households predominate among Car-Sharing participants. The average number of people in Car-Sharing households is just over two. Such were the results in the following studies: Taxistop, cambio 2009, City Car Club 2009, traffiQ 2007, Wuppertal Institute 2007, Synovate 2006.

Formal education

As is shown in Table 4.2, a significantly higher proportion of Car-Sharing customers possess a good formal education than the national average. This is a clear characteristic that appears in all known customer surveys in Europe.

Car-Sharing provider or area	Proportion of customers with higher formal education	Proportion of customers with a mid-level of formal education	Proportion of customers with other levels of formal education	Source
cambio Brussels, Belgium	60.1% with university education, 24.8% with other higher education (non-university)	6.9% secondary school completion	8.2%	Taxistop, cambio 2009
Various providers, Italy	41% with higher educational qualification	52% "graduate"	7%	IME 2009
3 providers in London, Great Britain	85% with bachelor's or master's degree	10% A-level	5%	Synovate 2006
2 providers in Frankfurt, Germany	70% with university degree	no response	no response	traffiQ 2007
10 providers in Germany	88.6% with A-levels or technical secondary school completion		3.8%	Wuppertal Institute 2007
		7.6% basic secondary education (O-levels)		

Table 4.2: Proportion of various levels of formal education among Car-Sharing customers

Employment status

The majority of private Car-Sharing participants are employed or self-employed. Proportionate to the age distribution, apprentices and students are underrepresented as a significant part of the younger age group and retirees of the older age group. The

unemployed and those who work in the household without their own income, are largely absent as Car-Sharing customers.

Individual results of the breakdown of occupations among Car-Sharing customers are:

- Higher proportion of (full-time) employed (71%) in Brussels than the population average (Taxistop, cambio 2009), whereby blue collar workers are underrepresented in relation to white collar workers. In Brussels, the second largest employment group among Car-Sharing participants is independent self-employed workers (13%).
- 52% employed, 22% self-employed in Italy (IME 2009).
- 89% employed at two Car-Sharing providers in Frankfurt, Germany (traffiQ 2007).
- 92% employed in London (Synovate 2006).

Car ownership

Car-Sharing participants distinguish themselves through the decidedly lower number of cars in their households than the population average. This can be seen in several studies and is summarised in Table 4.3. This also applies to households of Car-Sharing participants in Italy, despite the fact that the proportion of car-free households there is comparatively low.

Car-Sharing provider or area	Proportion of users or user households without a car	Source
cambio Brussels, Belgium	73%	Taxistop, cambio 2009
City Car Club, Helsinki, Finland	83%	City Car Club 2009
Mobility, Switzerland	76%	BfE 2006
Various providers, Italy	52%	IME 2009
3 providers in London, Great Britain	74%	Synovate 2006
2 providers in Frankfurt, Germany	92%	traffiQ 2007
10 providers in Germany	84% based on users, 70% based on households	Wuppertal Institute 2007

Table 4.3: Proportion of users or user households without a car

Season tickets for public transport

Table 4.4 shows the proportion of Car-Sharing customers with season tickets for public transport. Consistent results of all relevant studies show that a higher proportion of Car-Sharing customers have season tickets for public transport than the average population.

Car-Sharing provider or area	Proportion of regular public transport customers before joining	Proportion of regular public transport customers after joining	Source, notes
cambio Brussels, Belgium	No response	60% STIB 15% SNCB	Taxistop, cambio 2009; proportion of customers with a pass (STIB is the public transport company in Brussels; SNCB is the state railway company)
Various providers, Italy	no response	41%	IME 2009, proportion of customers with public transport pass
Mobility, Switzerland		73% A quarter of households possess more public transport passes today than before, 8% possess fewer.	BfE 2006; proportion of customer households with general passes, passes for a given route, or regional passes
2 providers in Frankfurt, Germany	28%	39%	traffiQ 2007; proportion of customers with yearly public transport pass
10 providers in Germany	no response	43.3%	Wuppertal Institute; proportion of customers with public transport season tickets

Table 4.4: Proportion of users with season tickets (yearly or monthly) for public transport

Summary

The tables in this chapter display very extensive socio-demographic consistencies among users. Nonetheless, the user distribution of different providers can vary significantly from one another. One example is a customer survey by the public transport operator traffiQ in Frankfurt (Germany) which encompassed the customers of two competing Car-Sharing providers (traffiQ 2005). Both providers started their Car-Sharing services in 2000. While the provider Stadtmobil Rhein-Main has a proportion of 55% men among its customers, the provider book-n-drive has 72%. Employed people account for 84% at Stadtmobil, and 93% at book-n-drive. The proportion of students at Stadtmobil is 9%, and 1% at book-n-drive. The proportion of participating households with a monthly household income over €3,000 net at Stadtmobil is 28% and at book-n-drive 39%.

In publishing this study, it should be noted that these differences represent a snapshot of a situation that has already changed (traffiQ 2007). This snapshot may be the result of different

target group-specific approaches by the providers and may, for example, represent some of the success of special rates targeted at certain groups.

4.1.2 Socio-economic categories of today's Car-Sharing participants

A newer German study from the Wuppertal Institute examined, among other things, the socio-economic category of Car-Sharing participants. Representative customer samples from ten German Car-Sharing providers of different sizes were used. A social science concept (adjusted for German society) from Professor Michael Vester of the University of Hanover was taken as a basis. The socio-economic category of those surveyed was established through a questionnaire with a set of 24 attitude items and a subsequent cluster analysis (Wuppertal Institute 2007).

Table 4.5 shows that the Car-Sharing customers, who were surveyed in 2004, belonged predominantly to the higher categories. Within the higher categories, Car-Sharing participants tended to be among those who take responsibility for themselves. As presented in the table, from top to bottom, people in each category exercise a decreasing level of authority within society. Within each category, the categories are arranged from an avant garde to an autonomous to a hierarchy-based, authoritarian concept of life.

In the lower categories, one comes across almost no Car-Sharing participants. One can see in the allocation of urban space, for example, that there are almost no Car-Sharing customers in blue collar neighbourhoods or neighbourhoods with a large proportion of social housing. In the middle categories, those who believe more in hierarchical or authoritarian structures are absent among Car-Sharing participants.

Socio-economic category	Socio-economic designation	Proportion of the German population	Proportion of Car-Sharing customers surveyed (n = 1,474)
Higher category	Educational liberal	approx. 11%	41.9%
	conservative-distinctive	approx. 12%	12.9%
Middle categories	young adventure-oriented wage earners	approx. 11%	10.2%
	autonomous modern wage earner	approx. 13%	13.3%
	educational bourgeois	approx. 12%	16.0%
	modern bourgeois wage earners	approx. 16%	4.8%
	restrictive bourgeois wage earners	approx. 9%	0.5%
Lower categories	adventure-oriented underprivileged	approx. 6%	0.0%
	realistic underprivileged	approx. 11%	0.5%

Table 4.5: Socio-economic categories of German Car-Sharing customers in the 2004 Wuppertal Institute study

In the Wuppertal Institute study, German Car-Sharing providers were criticised for allegedly only supplying limited Car-Sharing services. In particular, they were accused of not meeting the needs of the strongly car-oriented portion of the population, thereby consciously keeping parts of the population from Car-Sharing participation. This criticism is unsupported as the number of participants in German Car-Sharing has almost tripled from approximately 60,000 to almost 160,000 customers since the study was carried out. It can be assumed that, although the higher categories account for a majority of this growth, nonetheless, the diffusion process of Car-Sharing in all higher and middle socio-economic categories of society continues to progress.

It does, however, emerge from the study results that, while Car-Sharing is a cost-efficient service, it has nonetheless not (yet) reached certain lower categories. The assumption is that for these people, the ownership of a vehicle as a symbol of belonging to society possesses a much higher significance than the possible cost savings through Car-Sharing participation. This will be expanded on in chapter 7.

4.1.3 Reasons for joining Car-Sharing

A certain change in customer composition since the start of the first Car-Sharing services about 20 years ago can be seen in the reasons given for joining Car-Sharing. Asked about the most important reasons for joining, the environment is no longer in first place, as was the case with the pioneering generation. Instead, cost considerations and convenience motivations are becoming more important.

Table 4.6 lists the three most important motivations for participation in Car-Sharing from different surveys.

Car-Sharing provider or area	1 st priority	2 nd priority	3 rd priority	Source, notes
cambio Brussels, Belgium	“Have no car but need one occasionally” 33.2%	“Contribution to environmental improvement” 18.7%	“No worries about vehicle maintenance” 16.5%	Taxistop, cambio 2009; 3 possible answers from given alternatives
various providers, Italy	Permanently or temporarily without a car 48%	Economy of the service 17%	Practicality of the service 15%	IME 2009
3 providers in London, Great Britain	“Car-Sharing is cheaper than a personal car” 52% as main reason, 28% as additional reason	“Car-Sharing is more environmentally friendly than using a personal car” 16% as main reason, 38% as additional reason	“Car-Sharing is just as convenient to use as a personal car” 12% as main reason, 31% as additional reason	Synovate 2006
Mobility, Switzerland	“Environmental reasons” 29.6%	“Mobility was a financially attractive service” 21.4%	“Increasing transport need in the household” 6.7%	BfE 2006
2 providers in Frankfurt, Germany	Infrequent need for a vehicle 1.4	Expedient complement to public transport 2.0	Environmental protection 2.3	traffiQ 2007; average value, scale from 1 = very applicable to 5 = not applicable

Table 4.6: Most important reasons named by private customers for joining Car-Sharing

As well as the convenience and practicality of Car-Sharing use, the decentralised network of stations near the homes or workplaces of users also plays a role. This brings with it short distances to Car-Sharing stations and fast accessibility of vehicles. In Brussels, almost 80% of customers surveyed live less than one kilometre away from a Car-Sharing station. They get to their stations in most cases on foot or by bike (Taxistop, cambio 2009). In Helsinki, 60% of customers have to go less than 500 metres from their home to a Car-Sharing station, 40% more than 500 metres. The distance between workplace and Car-Sharing station is even shorter: 63% up to 500 metres, 37% more than 500 metres (City Car Club 2008). In London, 86% of customers surveyed reach the nearest station within 15 minutes, 34% within 5 minutes. The majority (79%) get to the Car-Sharing stations on foot (Synovate 2006).

What were the most important media and information channels through which customers were made aware of the Car-Sharing service in their city?

Car-Sharing provider or area	1st priority	2nd priority	3rd priority	Source, notes
cambio Brussels, Belgium	Friends and family (approx. 28%)	Coverage in the media (approx. 16%)	Through posters and brochures (approx. 12%)	Taxistop, cambio 2009
3 providers in London, Great Britain	Friends and acquaintances who are already customers (21%)	Through an Internet search engine (17%)	Through brochures in post boxes or at the Car-Sharing station (13% each)	Synovate 2006
2 providers in Frankfurt, Germany	Advertising: posters, brochures (48%)	Media: press, Internet, radio (32%)	Friend, acquaintance, colleague (23%)	traffiQ 2007; repeated mention possible
1 provider in Munich, Germany	Friends and acquaintances 32% (1996: 29%)	Overall advertising 26% (1996: 23%)	Media reports 16% (1996: 30%)	MVV 2003

Table 4.7: Most important media and information channels through which customers are made aware of Car-Sharing services

4.1.4 Satisfaction with Car-Sharing provider and service

From all known surveys of private customers, an exceptionally high satisfaction rate emerged with both the provider and the service. A noteworthy point is that those with an interest in Car-Sharing but no personal experience of it regularly display a certain amount of scepticism. They question – to a certain extent based on preconceptions – the dependability and availability of the service far more often than experienced users.

The high level of endorsement for Car-Sharing observable in all studies is even more pleasing in that it is a system whose quality depends to a large extent on the cooperation of its users. Through the automation of procedures, transfer of the vehicle from user to user takes place as a rule without the intervention of an employee of the provider. The satisfaction of each user thus depends to a great extent on the dependability and sense of responsibility of the previous user.

Table 4.8 compiles several findings on customer satisfaction.

Car-Sharing provider or area	Proportion of very satisfied customers	Proportion of satisfied customers	Source, notes
cambio Brussels, Belgium	50.0%	43.5%	Taxistop, cambio 2009
5 providers in Great Britain Existing customers	29% (50% previous study 2007)	51% (44% previous study 2007)	Myers, Cairns 2009
1 provider in Great Britain New customers	23%	49%	Myers, Cairns 2009
3 providers in London, Great Britain	93%		Synovate 2006
2 providers in Frankfurt, Germany	62%	33%	traffiQ 2007
Various providers, Italy	average satisfaction level 7.7 (range between 1 = not satisfied and 10 = very satisfied)		IME 2009
Mobility, Switzerland	average satisfaction 4.5 (range between 1 = very unsatisfied and 5 = very satisfied)		Mobility 2009

Table 4.8: Customer satisfaction ratings

Several of the studies carried out reflect satisfaction levels with individual components of the service and offer the providers detailed information about desired improvement or development needs from the customer perspective (e.g. IME 2009; Taxistop, cambio 2009).

In a 2006 survey of Car-Sharing customers in London, 62% of those surveyed said that their expectations upon joining were met, a further 34% of those surveyed said their expectations were more than met. Satisfaction grew even more with the length of participation, leading to the conclusion that satisfaction increases with the frequency of use.

However, two other customer surveys carried out in Great Britain at a later date and one to two years apart show a decline in satisfaction. This could mean that in the time between the two surveys, a large growth in customer numbers took place that addressed different population groups that had higher expectations of the service or lower tolerance levels of the provider. It is also possible that the very strong growth in customer numbers within a short period of time overextended the provider at the expense of the quality of service provided.

The result would be that the provider would have had to undertake great efforts so that high growth numbers would not be accompanied by a decline in quality of service.

In spite of the high customer satisfaction, a fairly significant customer fluctuation can also be observed. A survey carried out in 2003 of German Car-Sharing providers showed a high cancellation level for an array of providers that would comprise more than 20% of customers in a year (Loose et al. 2004). Growth in Car-Sharing is calculated as the total of new customers less the cancellations. The following reasons were given by providers for customer membership cancellation (presented in order of frequency of response): 1. a move to another city, 2. purchase of their own vehicle, 3. too little need for car use, 4. business reasons. Only then were changes in fees, dissatisfaction with the provider or the feeling that Car-Sharing use was too complicated given as reasons for membership cancellation. These were, however, not findings from customer surveys, but rather the more or less subjective opinions of providers about the customers' reasons for leaving.

A Swiss evaluation study published in 2006 was commissioned because the net growth in customer numbers of Mobility in 2004 and 2005 had flattened out in comparison to the previous years. This was not caused so much by a decline in new customers but more by an increase in cancellations in certain customer groups. The evaluation study undertook an analysis of reasons for membership cancellations.

The findings of both the German and the Swiss studies found that it was primarily changes in mobility needs that led customers to leave the service and less a case of dissatisfaction with the service or the provider. These customers, however, are not lost forever; as can be observed in individual cases, some return to Car-Sharing when circumstances again change.

The total number of Car-Sharing customers can include a large number of passive customers. A 2005 evaluation study by the Swiss provider Mobility shows this. Passive customers are defined as those who make no booking in the year in question. In Switzerland, passive customers make up 31% of private customers and 30% of business customers. Of course this proportion is influenced by the fee structure and can be even higher when membership fees (independent of use) are lower. In Switzerland, the large proportion of passive customers is also influenced by the strong collaboration with public transport organisations, thus many people become customers who mainly get around by public transport. For these customer groups, Car-Sharing mainly signifies mobility security to fall back on in case of emergency. But when public transport is well organised and functions superbly, as it does in Switzerland, these emergencies seldom arise.

4.2 Current business customers

Unfortunately, there is comparatively little systematically-collected information on existing customers who use Car-Sharing for business or work purposes. For one thing, this important customer group is not yet on the radar of some providers as a target for their advertising efforts. In addition, they are often not analysed separately in customer surveys.

From our own momo project survey of European Car-Sharing providers, we know that at least 16% of authorised users are business customers (see chapter 3). For individual providers, this proportion can be even higher.

Evaluation of business Car-Sharing in Switzerland

In 2005, 400 business customers of the Car-Sharing provider Mobility in Switzerland were contacted and asked to fill out a questionnaire. 144 companies filled out the questionnaire. On average, businesses participating in Car-Sharing employed 51 people. 36% of employees had access to the Car-Sharing vehicles, an average of 18 people per company (BfE 2006). The business customers were divided as follows:

employment sector of customers	Number of companies	Percent breakdown by sector	Number of access cards distributed	Proportion by access cards distributed
Services	89	60.0%	281	68.9%
Industry, construction	22	14.2%	61	14.9%
Non-profit organisations	14	13.5%	36	8.8%
Public administration	10	7.1%	19	4.7%
Other	7	5.2%	11	2.7%
Total	142	100.0%	408	100.0%

Table 4.9: Breakdown of business customers surveyed by Mobility, Switzerland by sector and authorised users (source: BfE 2006)

80 companies, or 56% of the businesses surveyed, had no company vehicles either before joining Car-Sharing or after. Five participating businesses reduced the number of their own company vehicles.

Car-Sharing for business customers in Italy

In Italy, a representative survey of 3,060 private and business users of Car-Sharing services in the cities of Bologna, Florence, Genoa, Milan, Modena, Parma, Rimini, Rome, Turin and Venice was carried out. The Italian Environment Ministry summarised the results of the study for the momo project (IME 2009).

Business customers of Car-Sharing in Italy are mainly recruited from private firms (92%) and to a lesser degree from public administrations (8%). 80% of business customers have fewer than 15 employees. On average, the firms and administrations have 1.7 electronic access cards for the Car-Sharing vehicles and they are used on average by 3.1 people. 40% of business customers are located in a low emission zone and 76% in a zone with active parking management.

40% of participating firms own no motor vehicles, 27% only have access to one vehicle, 19% to between two and five vehicles.

As reasons for participation in Car-Sharing, practicality of the service was given as the first priority (42%), followed by the need to replace a company vehicle that had been disposed of. On average, Car-Sharing vehicles are reserved by business customers 0.9 times per week. With this, an average of almost 140 kilometres is driven and just under €140 is paid out per month for Car-Sharing use.

Business customers give the Car-Sharing service a good rating but, at an average of 7.5, it remains 0.2 points below the rating of private customers (on a scale from 1 = not satisfied to 10 = very satisfied). A strikingly good rating was given for the service in Parma (8.3 by business customers, 8.1 by private customers), while business customers rated the service in Florence the worst (6.8 by business customers, 7.5 by private customers). The study also shows ratings of individual service components that are not reflected in detail here.

20% of business customers say that they have reduced their car use with Car-Sharing participation. 27% were able to reduce their local travel costs. 21% of business customers reduced their own company vehicle fleet through Car-Sharing participation.

40% of those surveyed said that the convenience of Car-Sharing outweighed the costs. For 38% of those surveyed, convenience and cost are of equal importance. Both the vehicles (range of models and cleanliness) as well as the stations (number and visibility) were seen as areas with room for improvement (each was mentioned by 21% of respondents). Fees are mentioned as the next most important point of criticism (mentioned by 13% of respondents).

Analysis of business customers at Stadtmobil Karlsruhe, Germany

In Karlsruhe, Car-Sharing has been offered since mid-1995. At the beginning of May 2003, there were 185 Car-Sharing vehicles in service at 69 locations in Karlsruhe and in the surrounding communities served by Stadtmobil Karlsruhe GmbH & Co. KG. At that time, business customers contributed approximately 10% to annual revenues. Stadtmobil did not offer specific business rates; however, large customers could negotiate individual fee arrangements. Business customers are also able to book in advance *en bloc* during certain time windows.

At the time of the study, Stadtmobil was still not pursuing any specific advertising or business development strategies for business customers.

From April to June 2003, within the context of an academic dissertation, a partly-standardised telephone survey was carried out of all Stadtmobil Karlsruhe business customers (Wanner 2003). In total, 66 interviews with business customers were able to be completed.

56% of the operations surveyed employ up to six people, 79% up to 19 people. Only one of the business customers surveyed represents a business with more than 100 employees. The majority are from the service industry. Ten business customers are clubs or organisations. Small business in the service industry and clubs and organisations can thus be seen as having a particular affinity for Car-Sharing. They make up – at least at the time of the study – the majority of Car-Sharing business customers.

It has been established through many surveys that private customers are often drawn to Car-Sharing by tips and information from friends and acquaintances who are already Car-Sharing members. It is somewhat surprising that a small majority of business customers (53%) are made aware of the service through a personal recommendation – for example through an employee who is a private Car-Sharing customer. A further 23% are made aware of it through print media and advertising within the city; this, of course, presupposes being very open to new ideas.

91% of the business customers surveyed have a Car-Sharing station in their direct vicinity. 67% have a maximum five minutes walk and a further 24% need a maximum of ten minutes.

For half of those surveyed, aside from Car-Sharing, both private cars and the train are used for business travel. 35% of firms also have at least one company car. Generally only a

portion of the distance covered by car for work purposes is done with Car-Sharing. For half of the businesses surveyed, up to 50% of work-related car journeys are made with Car-Sharing. A quarter of the operations – predominantly those who have no company car or personal car available for business use – do up to 90-100% of their car travel with Car-Sharing vehicles.

23 organisations surveyed own company vehicles. Three quarters of these have not changed their fleets since joining a Car-Sharing organisation. Thus they use Car-Sharing as a supplementary mobility option in combination with their own company vehicles and the use of the personal cars of employees. Car-Sharing participation may keep them from enlarging their own fleet.

As motivation for participation in Car-Sharing, 65% of those surveyed name cost savings. Better car availability followed with 33%, and then infrequent need for a car at 24%. Environmental reasons and low administration costs play a secondary role. Within the cost aspect (in the order of their importance), lower capital costs, lower fixed costs for upkeep of the fleet, and savings in vehicle care and maintenance are mentioned. Cost transparency in billing and gains in flexibility through access – even on short notice – to Car-Sharing vehicles and the option to book cars for as little as one hour are considered very important by many of those surveyed. While environmental motivation is not rated as particularly important, it is nonetheless a positive side effect. Three quarters do not see a lack of parking (for a personal vehicle) or the costs of parking spaces as significant.

Most business customers use Car-Sharing weekly or at least monthly. Almost 40% predominantly undertake journeys over 100 km with a Car-Sharing vehicle, one third drive an average of between 10 and 50 kilometres per booking.

With a mean of 1.8 over all aspects, the satisfaction of business customers with the service is very high (with possible responses between “very satisfied” = 1 and “not satisfied” = 5). The respondents express above-average satisfaction particularly with the following sub-areas: nearness of the location and accessibility of the vehicles (mean 1.1), dependability (1.5), availability of vehicles and customer service (both 1.7). The “worst” rating among the business customers surveyed – still a respectable 2.2 – is the area of travel costs.

Wuppertal Institute Study, Germany

In a longitudinal study by the Wuppertal Institute, the business customers of three German Car-Sharing providers were studied for a period of either one or four years (Wuppertal Institute 2007).

For two providers, there was an average of two authorised users per contracted customer, for the third, six. A quarter of the business customers were classified as passive, i.e. they made no bookings of Car-Sharing vehicles during the study period. It was determined that business customers book more frequently than private customers, drive farther per use and cover more total kilometres per year in Car-Sharing. Business customers access mid-sized cars more often than private customers. It is assumed that mid-sized cars are used by business customers particularly for longer journeys. In the course of the week, the vehicle use of private and business customers is largely complementary, with bookings by business customers generally during the day on weekdays and by private customers evenings and weekends.

Just under half of business customers reduced their kilometres travelled in the second year of participation, reflecting the “learning curve of Car-Sharing” also seen among private

customers (see chapter 5). The other half increased their kilometres travelled after the first year.

As an additional step in the study, an analysis was also done as to whether the travel cost guidelines of the German public service encourage or inhibit Car-Sharing use. Car-Sharing use for work travel is not excluded in any cost guidelines in Germany federally or at the state level; in only one state is it expressly mentioned. The business travel rules of private companies vary widely and some favour the use of the firm's own vehicles. Apart from this, company cars can frequently play a significant role as a motivating instrument in certain company hierarchies. There are no tax-related parameters that either promote or penalise Car-Sharing use. The advantage for companies lies, among other things, in the transparency of the billing and the ease of booking and car access.

In a cost comparison, it was determined in which cases Car-Sharing use is more cost effective than other available mobility solutions. In half of the cases studied, Car-Sharing was a more cost effective option. In many cases, the only option that was more cost effective was the business use of the personal vehicles of employees. If this alternative were excluded, for example, because of insurance uncertainties or risk, in five of six cases, Car-Sharing would be the most cost-effective car option. If more than one vehicle is needed at the same time, the cost advantages of Car-Sharing become even more evident.

When the costs of Car-Sharing use are compared with other available transport modes, the findings, among others, are:

- Car-Sharing is less expensive than vehicles from car rental agencies.
- Car-Sharing is less expensive than acquiring several smaller company cars and less expensive than acquiring a single company car of an upscale mid-sized model.
- The acquisition of a single smaller company car or an estate car is comparable with the cost of Car-Sharing.
- The car of an employee is the most economical alternative, since there are no acquisition costs for the company, but insurance causes problems in the case of an accident, which is why many firms or employees avoid this solution.

If the costs of an existing company car are compared with other transport modes, the cost comparison findings are, among others:

- With more kilometres driven, the acquisition of a company car or several small cars becomes more economical.
- The cost of the acquisition and upkeep of several estate cars is comparable to, or somewhat less expensive than, Car-Sharing use. For firms that do a good deal of travel for outside work and that are generally prepared to use different modes of transport, Car-Sharing use is less expensive in many cases than the acquisition of several company cars.
- To cover peak needs, Car-Sharing can be the most economical alternative.

4.3 Selected assessment of potential for future Car-Sharing use

In this section, a short overview will be provided of existing assessments of the potential of Car-Sharing that can give some direction in setting market goals. The studies are based on surveys of non-users and mainly include, in various combinations, current transport behaviour, spatial factors, and attitudes.

How realistic the numbers presented in the published studies of the future potential of Car-Sharing are can be judged by looking at Switzerland. One can compare the future customer numbers achievable under favourable conditions with the proportion of Car-Sharing customers Switzerland has already reached in relation to its total population. If, for example, Germany were to strive for a medium-term goal of a comparable saturation quota of Car-Sharing customers to what Switzerland's Mobility already has, a total of 900,000 users would be reached. Put differently: in order to attain market saturation in Germany comparable to what exists in Switzerland today, German Car-Sharing providers would have to solicit approximately 740,000 new customers. From this level, it is no longer a large step to the forecasted market potential of approximately 1.5 million customers.

Car-Sharing provider or country	Spatial limitations of potential users	Method	Number of potential users/ proportion of the total population	Study year	Source
Switzerland (provider Mobility)	Communities over 2,000 inhabitants in Switzerland	Proportion of the adult population with driving licence who live in residential areas that are easily reached by public transport, daily route to work without car; survey of potential customers: 36% of them are interested in Car-Sharing	613,000 potential customers = 8.7% of the Swiss resident population	1997/ 1998	Muheim 1998
Switzerland (provider Mobility)	Communities over 5,000 inhabitants in Switzerland	Population development, development of external conditions, based on previous analysis of potential by Muheim	500,000 customers as theoretical peak; 100,000 customers to 2008 as ambitious increase	2005	BfE 2006
Germany	Cities and communities over 20,000 inhabitants	Representative population survey: fitting "objective" criteria (possession of a driving licence, low car use frequency, marginal annual kilometres travelled by car, etc.) to subjective attitudes	1.5 to 2.0 million potential customers: 1.44 million in areas with existing C-S service, 0.6 million in areas without existing C-S service = 7% of the population surveyed	2003	Loose et al. 2004

Table 4.10, Part 1: Comparison of estimates of future potential for the development of Car-Sharing in different European countries

Car-Sharing provider or country	Spatial limits of potential users	Method	Number of potential users/ proportion of the total population	Study year	Source
Germany	population in cities over 50,000 inhabitants, between 18 and 65 years, with driving licence	Representative population survey, division into four social scientific-derived "mobility style" groups, comparison with 2002 national mobility study "Mobility in Germany"	Minimum 960,000 potential customers in cities over 100,000 inhabitants (maximum 2.0 million); minimum 54,000 potential customers in cities between 50,000 and 100,000 inhabitants (maximum 120,000); market volume 160,000 customers to 2010	2004	Knie, Canzler 2005; Maertins 2006
Germany	German-speaking people in large cities between 18 and 75 years with driving licence	Representative population survey: survey of interest in a basic or expanded form of "more adaptable Car-Sharing service" (e.g. with one-way bookings and open-ended bookings); demographic population development to 2020, current conditions of mobility development.	6.4 million potential customers 2020 (all interested parties) 2.1 million potential customers 2020 (only strongly interested parties) 1.5 million potential customers 2020 (with limited willingness of providers to invest) 0.87 million potential customers 2020 (with limitations of service expansion in central residential areas)	2005	Wuppertal Institute 2007

Table 4.10, Part 2: Comparison of estimates of future potential for the development of Car-Sharing in different European countries

Another approach follows a current (January 2010) study by the international consultancy Frost & Sullivan. It can be assumed that the audience for the study is international companies in the area of car manufacturing or car rental rather than traditional Car-Sharing providers. It is noteworthy in itself that Car-Sharing finds itself increasingly in the sights of international corporations and is becoming more and more interesting as a field of activity for these enterprises. Increasingly, new Car-Sharing services are brought onto the European market by these “newcomers” as pilot projects or even as ongoing business activities.

The Frost & Sullivan study is based on expert interviews and existing studies. The study differentiates between three scenarios, the Frost & Sullivan scenario, an optimistic scenario and a conservative scenario. Table 4.11 lists the assumptions and findings of the three scenarios. Possible or probable Car-Sharing development in Europe is examined.

	Frost & Sullivan Scenario	Optimistic scenario	Conservative scenario
Support through national political programmes	Limited integration of Car-Sharing in residential development in the large EU5 countries, only national support in EU5 countries (no EU support).	EU-wide Car-Sharing definition, political support for Car-Sharing and other environmentally-friendly transport modes, integration of Car-Sharing in residential development on a larger scale in EU15 countries.	Less political support, only at the introduction of electro-mobility, only regional or local support.
Mobility management	Integration of Car-Sharing services in national mobility management in large EU5 countries by 2013, regional e-ticketing in EU5 countries by 2014.	Integration of Car-Sharing services in national mobility management in all EU15 countries by 2015, acceptance of Car-Sharing as an environmentally-friendly transport mode.	Integration of Car-Sharing services in national mobility management only in France, UK and Netherlands by 2014, active support of two-wheeled modes instead of Car-Sharing.
Car-Sharing customers	Young generation as main target group of Car-Sharing providers, strengthened marketing efforts at universities.	Acquisition of business customers on a larger scale, EU-wide introduction of road charging leads to increase in new Car-Sharing users.	Marginal growth in business customers, less growth in customer numbers at universities.

Table 4.11, Part 1: Assumptions and findings of Car-Sharing scenarios for Europe from Frost & Sullivan

	Frost & Sullivan Scenario	Optimistic scenario	Conservative scenario
Car manufacturers	Collaboration with Car-Sharing providers, approximately four car manufacturers offer Car-Sharing themselves, for example Car2go by Daimler.	Most car manufacturers themselves offer Car-Sharing services as a new business model.	Only Daimler offers its Car-Sharing service in Europe, only marketing collaboration with Car-Sharing providers.
Services through Car-Sharing operators	Most C-S operators offer open-ended reservations and one-way journeys. Integration of most carpooling customers into Car-Sharing. Peer-to-peer Car-Sharing to be limited until 2013 due to security reasons and cars-on-demand schemes by most C-S operators.	Open-ended reservations and one-way journeys are largely implemented. Cars-on-demand and peer-to-peer Car-Sharing to be adopted across all C-S operators.	Few organisations offer open-ended reservations, cars-on-demand and one-way journeys. No peer-to-peer Car-Sharing in Europe.
Car rental and competition	Subsidiaries of car rental agencies offer Car-Sharing services in all important EU countries and larger cities.	Purchase of Car-Sharing companies by car rental companies. Amalgamation of most smaller Car-Sharing providers and purchase by large national providers in order to access rural areas.	Car rental agencies expand slowly into Car-Sharing business and only in large European cities. No new Car-Sharing providers or car rental agencies enter into Car-Sharing.
Number of customers in Europe 2015	Just under 4 million	More than 5.5 million	Approx. 1.5 million

Table 4.11, Part 2: Assumptions and findings of Car-Sharing scenarios for Europe from Frost & Sullivan

5. Environmental effects of Car-Sharing

As shown in the previous chapter, the environmental effects of Car-Sharing do not (any longer) play the main rôle in customers' decisions on Car-Sharing participation; they are for the most part simply taken for granted. But the argument for reducing environmental and traffic burdens is politically very significant. Insofar as any national, regional or local support exists for Car-Sharing through political bodies, it is based on Car-Sharing's contribution to traffic reduction.

When the first Car-Sharing service was implemented in Switzerland in 1987, it could have been seen as a reaction to the environmental debate over dying forests ongoing at that time. Car-Sharing was developed by this pioneering generation explicitly as an – in comparison – environmentally-friendly car service, whose implementation would afford some relief from environmentally-destructive air pollution.

The overall relief effect is based on individual effects that relate to both the vehicle aspect as well as the transport behaviour of Car-Sharing participants. In this chapter, the different individual effects of Car-Sharing will be addressed analytically and documented with study results from scientific studies and customer surveys in several Car-Sharing countries. The research results will make strikingly clear that Car-Sharing offers a noteworthy contribution to the reduction of the burden on transport and the environment. When integrated with the “eco-modes” (public transport, bicycle and walking), Car-Sharing presents a city-friendly and environmentally-friendly car component that is employed selectively and sparingly by its users.

5.1 Vehicle-related environmental effects

First of all, the effects achieved through the vehicles adopted into the providers' Car-Sharing fleets will be enumerated.

5.1.1 Car-Sharing vehicles are appropriate to the purpose of the particular journey

In Car-Sharing, smaller and newer vehicles are used than are found in the average household, creating fewer health-damaging emissions and, in comparison, using less fuel per kilometre driven, which is directly reflected in lower average CO₂ emissions.

The majority of the vehicles used in Car-Sharing fleets are super minis or small family cars. In Germany, for example, 70% of the vehicles in Car-Sharing fleets are of these classes. This fleet breakdown corresponds to the needs of customers and to journey purposes. The use of economical small cars is supported by Car-Sharing providers through user fees graded by vehicle size. Most journeys are short and are made alone or by only two people. For these, a small car is generally sufficient. For longer journeys or for journeys with a large amount of luggage or with several people, providers have a selection of larger vehicle models available which can be chosen specifically according to comfort level and purpose of the journey. Thus the customer can make a conscious choice to save fuel and to reduce CO₂ emissions through vehicle selection.

When purchasing a personal vehicle, different criteria are used to make the decision. Here, the annual holiday journey or infrequent family weekend excursions determine the choice of vehicle. As a result, unnecessarily large fuel-guzzling vehicles end up being used for day-to-day journeys.

5.1.2 Car-Sharing vehicles use less fuel and emit fewer pollutants

On average, Car-Sharing vehicles are newer than most personal vehicles, meaning that improvements in engine technology, in fuel efficiency and in emission levels are on the road faster in Car-Sharing vehicles than in personal cars.

Thus each kilometre driven in a Car-Sharing vehicle results in fewer health-damaging pollutants blown into the air and less fuel used. Table 5.1 shows the difference between the specific CO₂ emissions of several Car-Sharing fleets in comparison to personal cars by country (new or existing vehicles). In most cases observed, the difference lies between 15% and 20% with the highest being almost 25%. Nine European Car-Sharing providers with more than 20 vehicles in their fleets (weighted by the number of vehicles registered) show specific CO₂ emissions of 129.6 g/km. In contrast, the new cars sold in 2008 in 26 countries of the EU had specific CO₂ emissions of 153.5 g/km (EC 2010), putting them 15.6% higher than the existing Car-Sharing fleets. Even the Swiss Car-Sharing provider Mobility, with its relatively high specific CO₂ emissions of 151 g/km, is still 17.5% lower than the national average for new cars in Switzerland. The higher consumption level of Mobility's Car-Sharing fleet in comparison to other providers is likely owing to the more exacting customer desires in Switzerland.

The Car-Sharing association Carplus in Great Britain chose a rather different system for comparing specific CO₂ emissions. It compared the very economical Car-Sharing fleets of several British Car-Sharing providers with the personal cars that were made redundant through Car-Sharing participation. The specific CO₂ emissions were based on the average fuel consumption of six-year-old personal cars. The outcome was an exceptionally high emission difference of 36% in favour of the Car-Sharing fleet (Carplus 2008).

Many Car-Sharing providers, with their existing fleets, already meet the EU-established standard of 130 g/km for new cars that will be binding as of 2015.

In addition to the lower emission levels of climate gases, health-damaging gases are also emitted by the same order of magnitude less into the environment. That should also be kept in mind in light of the dominance of climate-relevant emissions in the environmental debate.

An English study points to a further connection between the vehicle aspect and behaviour-related relief of the environmental burden. Because the fee structure of Car-Sharing providers encourages the combination of several journey wishes, customers avoid individual short journeys. This leads to Car-Sharing vehicles being driven less with a cold engine, which is particularly polluting. According to this estimate, only 2% of the kilometres driven with Car-Sharing vehicles are driven with a cold engine (Carplus 2008, p. 7).

Car-Sharing provider or country	Specific CO ₂ emissions of Car-Sharing fleet	Number of Car-Sharing vehicles	Specific CO ₂ emissions of the average personal car in the country in the reference year	Reduction in emissions of Car-Sharing fleet	Reference year	Source
10 large providers in Europe, various countries	141.9 g/km	3,828	153.5 g/km (only new cars in 26 EU countries)	7.6%	2009	momo survey (see chapter 3); EC 2010
9 large providers in Europe (excluding Mobility), various countries	129.6 g/km	1,628	153.5 g/km (only new cars in 26 EU countries)	15.6%	2009	momo survey (see chapter 3); EC 2010
10 small providers in Europe, various countries	128.1 g/km	94	153.5 g/km (only new cars in 26 EU countries)	16.5%	2009	momo survey (see chapter 3); EC 2010
Mobility, Switzerland	151 g/km	2,200	183 g/km (new cars only)	17.5% (total 1,510 tonnes in the year)	2008	Mobility 2009
Mobility, Switzerland	155 g/km	1,750	189 g/km new cars 207 g/km car fleet	18% 25%	2005	BfE 2006
Denzel Mobility, Austria	126 g/km	169	158.1 g/km (2008)	20.3%	2009/2008	Denzel Mobility; EC 2010
cambio, Germany	129 g/km	575	165 g/km (2008, new cars only)	21.2%	2009/2008	cambio 2009a; KBA 2009

Table 5.1, Part 1: Comparison of the specific CO₂ emissions of different Car-Sharing fleets with the average personal car in various countries

Car-Sharing provider or country	Specific CO ₂ emissions of Car-Sharing fleet	Number of Car-Sharing vehicles	Specific CO ₂ emissions of the average personal car in the country in the reference year	Reduction in emissions of Car-Sharing fleet	Reference year	Source
cambio Belgium, Belgium	117 g/km (Flanders), 120 g/km (Brussels), 122 g/km (Wallonia)	248	155 g/km (new cars only)	21.3% to 24.5%	2008	Information per e-mail, Taxistop
various, Great Britain	110 g/km	No response	171 g/km (use of the private cars that were replaced)	36%	2007 or 2001	Carplus 2008
various, Germany	148 g/km	1,042	176 g/km (new cars only)	16%	2003	Knie, Canzler 2005

Table 5.1, Part 2: Comparison of the specific CO₂ emissions of different Car-Sharing fleets with the average personal car in various countries

In the emissions comparison in Table 5.5, it should be noted that because of a lack of available data in almost all comparisons, only new personal vehicles are compared with entire Car-Sharing fleets. As Car-Sharing vehicles have an average lifespan of three to four years, vehicles that are several years old are compared to new vehicles. A comparison between new vehicles in both groups would make the differences even more apparent.

5.1.3 Alternative drive systems in the fleet

To date, vehicles with particularly low emissions or climate-friendly drive systems have been introduced into Car-Sharing fleets in only a few cases. Results from the momo survey are reported in chapter 3. Where special systems are employed, they are primarily CNG systems – several Italian Car-Sharing providers are pioneers – or hybrid vehicles. These bring added benefits particularly to urban environments.

Based on their emission performance and their battery range, electric vehicles would actually be ideal for use in Car-Sharing but they have been used rarely in Car-Sharing to date. An exception is the provider in the French city of La Rochelle. This city has long been known for the support electric mobility receives from its local administration. In 1999, within the framework of the European project LISELEC, electric Car-Sharing vehicles were introduced.

Some of the reasons alternative drive systems haven't been used more often in Car-Sharing to date are:

- The often significantly higher purchase cost of vehicles with alternative drive systems are difficult to reconcile financially within the Car-Sharing fee structure (lower fees for smaller cars) given the relatively short lifespan of vehicles used in Car-Sharing.
- Without financial project support, the relatively tight budgets that most Car-Sharing providers work within don't allow them to act as testing grounds for not-yet-fully-developed vehicle technology, and thereby take on the manufacturers' financial and availability risks.
- Alternative drive systems may be seen as barriers by inexperienced Car-Sharing customers who may fear being billed for any mistakes they make (for example in refuelling/recharging). This constraint exists even if fears are based primarily on customer perception and in only a few cases on fact.
- Especially when adopting electric vehicles, it would need to be clarified in practice how the charging interval between uses can be managed so that the level of use per day can be optimised. The average private user only drives approximately 25 to 40 kilometres per use. Thus, on statistical average, at least three users could reserve the electric car one after the other without having to calculate in time at an outlet for charging. Nonetheless, it must be ensured that a user who drives 100 or 120 kilometres isn't stranded on the road with an empty battery.

In a survey of Brussels Car-Sharing customers by the Belgian provider cambio, almost three quarters responded that they would be happy to use cars with particularly environmentally-friendly drive systems. Only three percent declined and 23 percent were neutral. Almost all customers agreed with the assertion that their Brussels Car-Sharing provider would be particularly well suited to play a key rôle in the introduction of alternative drive systems at a national level. Approximately 60 percent of those who responded positively would also be prepared to pay higher fees for more environmentally friendly vehicles or to accept a reduction in performance levels from the vehicles currently available with alternative drive

systems, but only if the difference from the current price weren't too great. Among the preferred alternative drive systems, electric vehicles and those with hybrid drive systems were clearly preferred. Bio-diesel drive systems had the least support (Taxistop, cambio 2009).

European Car-Sharing providers certainly face up to their responsibility toward the environment. Several providers are partners in ongoing national or EU-wide implementation projects to test electro-mobility. Nonetheless, the public debate around electro-mobility, and the repeated demands that Car-Sharing providers should participate, has raised false expectations. As at the end of 2009 no major car manufacturer had yet offered on the market a small electric car ready for mass production. Only a few minor runs in pre-mass production are offered on a limited market. To date, Car-Sharing providers been among the recipients of the first deliveries only in exceptional cases. Not until the second half of 2010 or the beginning of 2011 will larger lots of these electric vehicles be available for Car-Sharing providers to bid on. Vehicles from smaller manufacturers do not fulfil the normal vehicle safety standards and are thus less appropriate for Car-Sharing use.

5.2 Behaviour-related environmental effects

Together with the vehicle aspects of environmental relief, Car-Sharing services also actively influence the mobility behaviour of customers and support a "car-light" mobility orientation.

5.2.1 Each Car-Sharing vehicle replaces at least four to eight personal cars

Customer surveys show again and again that Car-Sharing participants own a below-average number of personal cars in comparison to other households. Some of these survey results are listed in Table 5.2.

CS provider or area	Number of car-free households before joining	Number of car-free households after joining	Source
3 London providers	49%	74%	Synovate 2006; the number of persons without regular access to a car was asked
4 (in some cases 5) providers in Great Britain			Myers, Cairns 2009
existing customers	49%	86%	
new customers	47%	82%	
customers in London	50%	88%	
customers outside of London	44%	75%	
Mobility, Switzerland	60%	76%	BfE 2006

Table 5.2: Number of car-free Car-Sharing households before and after joining

For the sample in the study by Myers and Cairns in Great Britain, it was determined that a total number of 2,369 fewer personal vehicles were owned by Car-Sharing participants in a before-and-after comparison. Extrapolated to all Car-Sharing users in Great Britain, a total of more than 25,000 personal vehicles would be disposed of after joining Car-Sharing (Myers, Cairns 2009, p. 24). Hence a comparatively high ratio is calculated of 14 personal cars disposed of for every Car-Sharing vehicle (see Table 5.4).

While the list doesn't shed any light on the reasons why these participant households don't have access to a car, the rise in number of car-free households after joining shows that the need for a personal car declines. Thus the probability is less that a personal car will be used routinely for every possible purpose and selective and less regular car use becomes more probable.

A further effect reported is that, even for households that still possess a personal car, the number of cars available has dropped significantly. This means that with Car-Sharing participation, second or third cars are disposed of.

An interesting related detail is disclosed in a Swiss evaluation study from 2006 (BfE 2006). It illustrates how the number of new customer households without motor vehicles has changed over time. It should be noted however that the expression "motor vehicle" is used in the table, meaning that, together with personal cars, motorcycles, motor scooters and mopeds are included. The number of households that may have access to a motor vehicle but don't possess a personal car is thus higher than is apparent from the table.

The analysis shows that in the last four years of the study, the number of households with motor vehicles that become Car-Sharing customers has increased. This implies that the Car-Sharing service in Switzerland is becoming increasingly attractive for households that possess cars. Taking into consideration this change, the conclusion reflected in Table 5.3 is that Mobility customers in Switzerland considerably reduced their car ownership levels during Car-Sharing participation.

Customer since	Households without a motor vehicle in the household before joining Mobility	Number of households without a motor vehicle
1991 – 1996	38	51.4%
1997 – 1999	72	54.5%
2000 – 2001	68	57.6%
2002 – 2003	48	51.6%
2004 – 2005	46	47.4%
Total	272	average 52.9%

Table 5.3: Number of new customers without a motor vehicle by year of joining Mobility (BfE 2006, p. 24)

Table 5.4 presents survey results of the number of cars that are disposed of or planned vehicle purchases that were not carried out by Car-Sharing customers.

Car-Sharing provider or area	Number of Car-Sharing customers who got rid of (at least) one car	Number of Car-Sharing customers who decided against a planned vehicle purchase	Each Car-Sharing vehicle replaces ... personal cars	Study year	Source
4 (in some cases 5) providers in Great Britain Existing customers New customers	40.3% 37.9%	25.8% 24.2%	14 9	2008	Myers, Cairns 2009
3 providers in London, Great Britain	19% (13% directly before, 6% after joining)	29%	No response	2006	Synovate 2006
cambio Brussels, Belgium	15.7% (29% of the Dutch speaking customers, 13% of the French speaking customers)	10% (concerning a sure purchase) 25% (concerning a probable or sure purchase)	at least 4.5 to 7.5 (11, if the avoided purchases are included)	2009	Taxistop, cambio 2009
Mobility, Switzerland	26.3% (private motor vehicles in 520 households) 5.3% (company vehicles for 142 business customers)	No response	No response	2005	BfE 2006

Table 5.4, Part 1: Survey results on car ownership in the households of Car-Sharing customers

Car-Sharing provider or area	Number of Car-Sharing customers who got rid of (at least) one car	Number of Car-Sharing customers who decided against a planned vehicle purchase	Each Car-Sharing vehicle replaces ... personal cars	Study year	Source
Customers of two Car-Sharing stations mobil.punkt in Bremen, Germany				2005	Bremen 2005
Private customers	30%	55%			
Business customers	21%	67%	9		
2 providers in Frankfurt am Main, Germany	14 %	27 %		2004	traffiQ 2007
Various providers, Germany	16%	33%	No response	2003	Maertins 2006; Knie, Canzler 2005

Table 5.4, Part 2: Survey results on car ownership in the households of Car-Sharing customers

Even if the studies listed in Table 5.4 don't yield scientific proof that Car-Sharing participation is in fact the causal trigger for the "car diet," it can be established as fact that Car-Sharing households, on statistical average, have access to fewer personal cars than comparable population groups.

As a generalisation from the customer surveys, it can be said that, on statistical average, each newly-acquired, normally used Car-Sharing vehicle replaces at least four to eight personal cars, in some cases, even more.

Reducing parking pressure – everybody benefits

The reduction of car ownership through Car-Sharing leads to a decrease in pressure on parking in neighbourhoods in which a particularly high number of Car-Sharing customers live. This choice by Car-Sharing participants benefits everybody, most of all their car-dependent neighbours.

In calculating the space that would be required to park each of the four to eight cars that are replaced by each Car-Sharing vehicle, you find that at least 40 to 80 m² of public street space or at least 80 to 160 m² of space in car parks or on private land with its own entrance is freed up. If you consider the fact that cars also require parking spaces in more than one location each day, the amount of reclaimed public space increases even more.

The "unbought" personal cars play a role not only in saving space in cities. Raw materials and energy are also saved when fewer vehicles need to be built. Assuming a car with an average lifespan, approximately one fifth of the emissions and climate damage it is responsible for are caused during the production process of the car – before a single kilometre is driven.

Car-Sharing creates potential for better quality of life and urban form

The problem with the space gained through Car-Sharing is that the parking spaces that are theoretically freed-up are rarely actually visible. They are immediately occupied in densely built neighbourhoods through increased car ownership by other residents, by commuters who work there, or visitors, all of whom are pleased if they have to circle the block one time less in search of a parking space. Decreased parking pressure, which occurs gradually with each new Car-Sharing participant, generally isn't noticed in casual observation, rather only through systematic observation.

Theoretically, the space freed up by Car-Sharing could be employed for other appropriate urban uses. It could, for example, be made available for non-motorised modes (cyclists and pedestrians). Local planners could also designate this space for reorganising squares and street space, thus improving the quality of life in neighbourhoods.

Reducing the space burden through Car-Sharing

A good example can be found in the newly-developed neighbourhood of Vauban in the southern German city of Freiburg of how a conscious decision not to own a car but instead to meet vehicle needs through Car-Sharing manifests itself as an actual relief of space pressure. There, car-free households can meet the legal requirement of one parking space per newly-built flat through the purchase of a property share. Car-owning households have to purchase a car parking space in a central community garage. Car-free households, on the other hand, can get around this through a yearly declaration to the local authorities of their car-free status and membership in an association that owns a section of land in the

neighbourhood (see Figure 5.1). On this land, green space and play areas were established that are used by all residents of the neighbourhood. For the acquisition of their share of this open space, they only pay a fraction of the cost that car-owning households must come up with for the acquisition of a parking space in a central neighbourhood car park. The consciously car-free households of the neighbourhood – for the most part, Car-Sharing customers – not only contribute to traffic reduction but they also improve the green balance and quality of life in their immediate environment.



Fig. 5.1: Map of the neighbourhood of Vauban in Freiburg (Germany) with two central car parks and a green area (left) where car-free households have to build a car park if they purchase cars

Car-Sharing vehicles are used efficiently

Table 5.5 highlights that, on average, there is a multitude of users per Car-Sharing vehicle. The data were taken from Table 2.1 in chapter 2 and the analysis of users per vehicle expanded upon. As results are only included from countries from which reliable numbers were available and which are already past the initial start-up phase, the results fluctuate between 20 and 59 users per Car-Sharing vehicle on average. Concretely, this depends, for example, on whether a monthly fee is applied above and beyond the pure cost of use; this lowers the number of passive users and corrects the user statistics. The level of use of active users also plays a role.

Country	Car-Sharing customers	Vehicles in Car-Sharing	Statistical ratio of users per Car-Sharing vehicle
Austria	11,000	169	65:1
Belgium	6,932	248	28:1
Denmark	approx. 5,000	225	22:1
Finland	2,232	38	59:1
France	13,000 (estimated)	700 (estimated)	(19:1)
Germany	137,000	3,900	35:1
Great Britain	64,679	1,459	44:1
Ireland	23	9	3:1 (data from the early development stage)
Italy	13,208	498	27:1
Netherlands	27,000 (estimated)	1,832	(15:1)
Portugal	100	12	8:1 (data from the early development stage)
Spain	2,504	127	20:1
Sweden	14,889	More than 492	(30:1)
Switzerland	84,500	2,200	38:1
Total	382,067	11,909	

Table 5.5: Car-Sharing customers and vehicles in Europe, part 2

5.2.2 Cost transparency reduces kilometres driven

The high acquisition costs of a personal car form a large, rationally understandable barrier that starkly decreases the willingness of car drivers to choose the transport mode(s) most appropriate for each specific journey. The monthly depreciation of a new car associated with the acquisition costs are not seen as influenceable. This leads to the attitude: “the car is paid for anyway so we should use it as much as possible.” Such an attitude overshadows the strengths of other transport modes for certain journeys and certain times. Their costs are seen as additional and are, in comparison, often overestimated. This perception by car owners prevents optimal use of multiple modes of transport.

The cost structure of Car-Sharing is the exact opposite of this, which is why it fits so well among the eco-modes of transport which help reduce the burden on our transport system. In Car-Sharing, apart from the minimal monthly fee, almost all costs are incurred through use of Car-Sharing vehicles. As a rule, the user fees are differentiated into a kilometre fee and a time fee that are transparently displayed for each individual journey in a monthly bill. This cost transparency leads to fewer unnecessary kilometres being driven and vehicles not being booked for more time than they are needed by a user. Car-Sharing vehicles are thus used considerably more efficiently than personal cars or even cars from rental agencies.

Orientation toward the local

In a survey which was carried out in Munich (Germany) twice with identical questions, it was established that after joining Car-Sharing, participants look for activities closer to home (MVV 2003). Their destinations shift more toward their own neighbourhood or to neighbouring ones and they look for destinations outside of the city more rarely. Aside from the savings in transport use, this also strengthens the local economic structures in participants' own or neighbouring neighbourhoods.

Learning curve of Car-Sharing

Car-Sharing participants take more journeys and travel more kilometres using environmentally-friendly modes of transport than before they joined. In addition, the Car-Sharing use of a group of Car-Sharing customers drops with time. Peter Muheim calls this effect the learning curve of Car-Sharing participation (Muheim 1998). In two-month intervals over a period of two years, the kilometres driven by 870 active Swiss Car-Sharing customers were analysed and it was found that the kilometres driven gradually decreased. Muheim names three reasons for this:

- Car-Sharing customers learn to make better use of the alternatives to car use. They discover, for example, the possibilities of public transport or get a better bicycle for day-to-day travel.
- Car-Sharing participants develop strategies for combining journeys instead of making each one individually.
- Car-Sharing fees, which are seen as high, lead customers to access other cars in their circle of friends and acquaintances.

This effect, described over ten years ago, was confirmed in a more recent German study carried out by the Wuppertal Institute for Climate, Environment, Energy. The Car-Sharing use of more than 2,100 customers from three larger German Car-Sharing companies was compared over a period of four years. In the second year, participants decreased their kilometres driven with Car-Sharing vehicles by an average of 1,170 km in the year. That was 520 kilometres fewer than in the first year of participation. The reduction of kilometres driven with Car-Sharing vehicles represented approximately 31% per customer contract (Wuppertal Institute 2007, p. 47).

The decrease in use over time was also observed in a London study although the comparison was over a period of only three months from joining. The authors offer as explanation that joining Car-Sharing apparently served to satisfy a certain transport need at the time and then the use levelled off afterward at a lower level (Synovate 2006, p. 22). It could however also be that over this short period, testing of the new mobility service played a rôle.

The effect of reduced driving does not necessarily continue with longer Car-Sharing participation: once the learning effect is achieved, use settles down to a more or less constant level.

In summary, the Car-Sharing learning curve can be seen as the self-reinforcing consequence of two desirable environmental effects: on the one hand, it is the result of increasing cost awareness, created by transparent billing which includes the itemised costs of each individual journey. On the other hand, it can be seen as the result of learning about the availability of other modes of transport.

5.2.3 Car-Sharing changes driving behaviour

Fee integration between Car-Sharing providers and public transport companies

Car-Sharing providers go one step further so that Car-Sharing is more than simply another way to access a vehicle, but rather it actively lightens the environmental and traffic load.

Throughout Europe Car-Sharing is designed to be an integrated service which seeks collaboration with the eco-modes (public transport, cycling and walking). This is shown, for example, by the fact that many Car-Sharing providers offer package deals with public transport providers and special rates to regular public transport users. This collaboration will be presented in more detail in chapter 6.

The fee structures of Car-Sharing generally make Car-Sharing use less expensive than driving a new personal vehicle when the user drives fewer than 10,000 to 12,000 kilometres a year, although that applies only insofar as one does not need a car on a daily basis. For many private Car-Sharing customers, this supports an attitude to driving in which Car-Sharing use is combined with the eco-modes for everyday transport.

The cost transparency and the consciously-set fee structures of Car-Sharing result in participants considering the least expensive means of transport for each journey and destination. Here, the strengths of each individual mode of transport are shown to advantage. For most Car-Sharing participants, a car journey with a Car-Sharing vehicle isn't their first choice when other modes (public transport, cycling, walking) are available. In contrast to the personal car, Car-Sharing focuses attention on the other eco-modes and thus positively influences transport choices.

With Car-Sharing, the entire range of transport modes is used

Aside from the changes in focus of transport modes of Car-Sharing participants described above, transport behaviour also changes with Car-Sharing participation. This can be seen in different transport choices made for day-to-day journeys between the time before Car-Sharing participation and the time with Car-Sharing. Nonetheless, methodological criticism has been expressed about asking current Car-Sharing participants which modes of transport they employed to get around before and how many kilometres they travelled with individual modes. The reasoning is that people who have been Car-Sharing members for several years cannot have precise enough memory of their earlier transport behaviour. The conditions between the two time periods could also have changed fundamentally and getting around without Car-Sharing today could look very different.

A Swiss evaluation study chose another point of comparison (BfE 2006). Current Car-Sharing participants were presented with their last three Car-Sharing bookings and were asked how they would have made those journeys without the Car-Sharing service. Four main possibilities come up:

- The journey would not have taken place without the Car-Sharing service or would have been shifted to a later time. This would have a positive effect on the hypothetical eco-balance without Car-Sharing. According to the results 13.5% of the Car-Sharing journeys evaluated would not have taken place.
- The journey with the Car-Sharing car would have been made instead by public transport or a bicycle or a combination of environmentally friendly transport modes, which would have improved the eco-balance.

- It is also probable that Car-Sharing participants would have borrowed cars from friends or relatives, which has a marginal effect on the eco-balance.
- Without the Car-Sharing service, a portion of the Car-Sharing participants would have acquired one or more cars and made the journeys with those cars. This would have significantly worsened the eco-balance as this transport choice would also have influenced other journeys. This answer was chosen by 22.3% of the households of private customers surveyed.

The findings of changed transport behaviour by Car-Sharing participants in the event that there were no Car-Sharing service is summarised in Figure 5.2. The evaluation is based on 920 Car-Sharing journeys by 520 participant households. Without a Car-Sharing service, the kilometres travelled by public transport would decrease by 12%. In contrast, the kilometres travelled by car would increase by a good 26%.

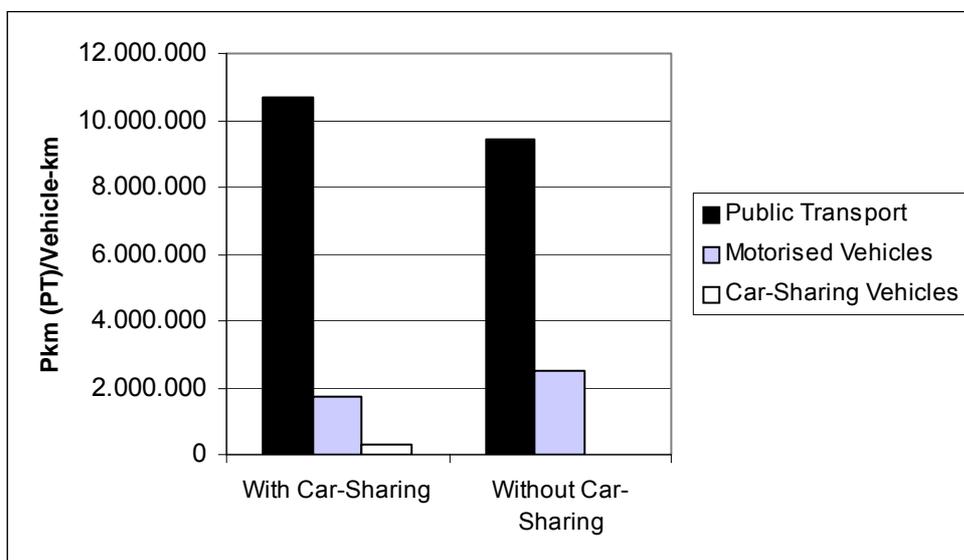


Fig. 5.2: Distances driven by 520 Car-Sharing households in Switzerland with and without Car-Sharing services

For the energy balance of these 520 households, this means a savings of 0.91 terajoules (TJ) a year through their Car-Sharing participation (see Figure 5.3). These positive findings come about mainly because without the existence of a Car-Sharing service, 22.3% of the households surveyed would acquire one or two cars and then would also make other journeys by car that they now make with other transport modes.

Extrapolated to all of the customers of the Car-Sharing provider Mobility in the study year 2005, the result would be a total energy saving through the Car-Sharing service of 78.4 TJ per year. According to the authors' data, that equates to the energy content of approximately 2.5 million litres of petrol.

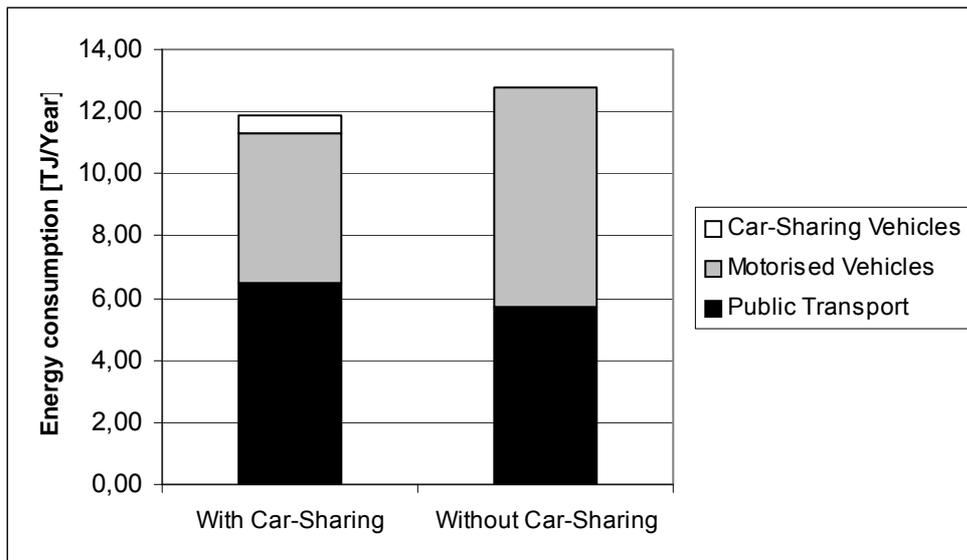


Fig. 5.3: Annual energy use of 520 Car-Sharing households in Switzerland with and without Car-Sharing services

For the sake of completeness, the results of an assessment of the positive effects of Car-Sharing for business customers will also be given. It must however be noted that these data are based on a very narrow survey sample and any extrapolation made would not be very reliable. Two different approaches for the extrapolation were chosen: Approach 1 counts the positive effects on the basis of the Car-Sharing journeys replaced. Approach 2 also incorporates the effects of additional company cars acquired.

In approach 1, the total energy saving through the existing Car-Sharing service for business customers in Switzerland is estimated at 3.0 TJ and at 28.4 TJ in approach 2. Looking at climate gases, approach 1 results in a saving of 183 tonnes of CO₂ and approach 2 in a saving of 2,568 tonnes. The authors note however that for the assessment, further basic information would have to be collected which was not available at the time of the study.

The British Synovate study asked Car-Sharing users in Greater London about their car use before and after joining Car-Sharing. All forms of car use were included. The number of days of use in the year was gathered from the frequency data. Car-Sharing users used cars on 64 days in the year before joining, which is already relatively low car use. After joining Car-Sharing, the number dropped to 41 (Synovate 2006, p. 12). The frequency of car use dropped by more than one third. While in other surveys, public transport benefited from this change in use, the differences in public transport use in London were almost imperceptible. The number of days of use of public transport went up only slightly from 233 in the year to 242. It must, however, be noted that public transport use was already very high before joining. New Car-Sharing customers show a frequency of public transport use twice as high as the non-Car-Sharers surveyed. The results of this study served as the basis underlying Transport for London's very ambitious political strategy for Car-Sharing (see chapter 2.2.7).

Car-Sharing vehicles not the only form of car use of Car-Sharing customers

Several newer studies show that Car-Sharing vehicles are not the only form of car use by Car-Sharing customers. This applies equally to car-free households.

The Swiss evaluation study from 2006 demonstrates that today's Car-Sharing participants drive significantly more with non-Car-Sharing vehicles than with Car-Sharing vehicles. Only about one seventh of the total motor vehicle kilometres travelled are done with Car-Sharing cars (see Figure 5.2) (BfE 2006). The remaining six sevenths are done in other motor vehicles, including cars borrowed from friends or relatives, taxis, rental cars, but also as a passenger in someone else's car.

Another study documents the fact that only every third Car-Sharing participant from a car-free household has absolutely no other access to a car (apart from Car-Sharing vehicles) (Maertins 2006, p. 39). This fact was often overlooked in earlier Car-Sharing studies.

Just as the eco-modes of transport became a focus for Car-Sharing participants, with the disposal of a personal car, the entire range of car use becomes of greater interest. Aside from borrowing cars from friends and relatives, taxis and rental cars are also used more. Sometimes more kilometres are travelled with these cars than with the cars of their Car-Sharing provider. Despite this, the fact still remains that all studies show Car-Sharing participants travel a lower number of total kilometres by car.

5.2.4 Car-Sharing services a cause for environmentally-friendly transport behaviour or only a supportive mobility service?

In German and Swiss studies the question is asked whether availability of a modern Car-Sharing service is the reason for the environmentally friendly transport behaviour of its users or if this transport behaviour already existed and Car-Sharing just reinforces it. But by means of qualitative case studies and quantitative surveys of new Car-Sharing customers and long time participants, in her dissertation Harms determines that joining Car-Sharing in most cases is predated by profound changes in the personal and professional lives of participants. These changes in personal life context put into question previous transport behaviour and contribute to a change in mobility habits. According to the author, only following such changes is information about other previously irrelevant transport options assimilated and therewith the interest in Car-Sharing discovered.

Harms emphasises that, in such a cause-and-effect context Car-Sharing plays the rôle of a stabilising service that makes life in the future possible without a personal car. This confirms the insight that many participants – even those who rarely used a car before joining – see Car-Sharing as mobility security. It reinforces largely environmentally-friendly transport behaviour and ensures that life without a personal car isn't perceived as limited in mobility options.

In a qualitative study using nine case studies, Franke shows that joining Car-Sharing can be the result of a long term awareness-changing and behaviour-changing process. The steps toward participation are mostly triggered by cumulative changes in people's personal lives (Franke 2001).

5.2.5 Car-Sharing reduces the CO₂ burden of transport

The greater reliance of Car-Sharing customers on the eco-modes as compared to non-Car-Sharing users helps relieve the burden on the environment and on city traffic. In Switzerland, the study cited above also looked at what impact this driving behaviour has on transport-related CO₂ emissions.

In the emission calculations, the study concluded that each active Swiss Car-Sharing user emits 290 kg of CO₂ less each year because of Car-Sharing participation than he or she

would without it. An “active” Car-Sharing user is defined here as someone who used a Car-Sharing car at least once in the year the study was carried out.

The Wuppertal Institute study arrives at a balance for the emissions effects of current Car-Sharing in Germany (Stand 2005) at 142 kg CO₂ equivalent per active user per year (Wuppertal Institute 2007, p. 131). That is almost exactly half the Swiss value.

A Car-Sharing study carried out at the Berlin Science Centre reports on a level of kilometres travelled by Car-Sharing participants in Germany that was much higher than had been documented in other studies. What stands out is that a comparably very high proportion of the weekly kilometres travelled were by train. That may be because the study sample, as well as customers of local Car-Sharing providers, also comprised a notable proportion of customers of the national Car-Sharing provider DB Rent GmbH, a subsidiary of German Rail or the study design with a sample group comprised of those close to rail stations captured more selectively than usual the kilometres travelled by train as compared to other studies. Nonetheless, the weekly number of kilometres travelled by the Car-Sharing customers does not differ in order of magnitude from that of the average population with driving licence in cities with over 50,000 inhabitants. For the climate balance, the crucial point is that these kilometres travelled are, for the most part, done with the eco-modes so that the greenhouse gas emissions (CO₂ equivalent) of Car-Sharing participants in comparison to the control group are a good third lower (Maertins 2006).

In 2007, the UK Energy Research Centre published a projection of the level of CO₂ savings a Car-Sharing support programme would contribute. In the findings, the researchers arrive at savings of 64,000 tonnes of CO₂ annually in 2010 for a somewhat ambitious scenario and of 115,000 tonnes CO₂ annually for a very ambitious scenario (UK ERC 2007). This is based on 88,000 users in 2010 in the middle scenario and 118,000 users in the higher scenario. The present numbers very probably range above the middle scenario; in light of the successful numbers of the past two years in London, reaching the ambitious scenario is not out of the question.

5.2.6 Voluntary measures: CO₂ offsetting through the provider or the user

A few Car-Sharing providers and their customers are going one step further by offsetting the CO₂ emissions from their Car-Sharing use by investing in climate protection projects that help to slow down the increase in CO₂ concentration in the atmosphere. The thought process behind this is that, against worldwide climate warming, it is irrelevant in what location measures are carried out. It is most efficient to implement climate protection projects where the largest reduction effect can be achieved with the available financing. Offsetting agencies mediate between users who voluntarily choose to pay to offset their energy use (and the related climate gas emissions) that are then invested in climate projects. They buy emissions certificates from the worldwide certificate market and thus reduce worldwide CO₂ “polluting rights.” CO₂ offsetting is however a mathematical emissions offset that does not reverse the emissions produced by those who choose to offset.

The Swiss Car-Sharing provider Mobility both offsets the CO₂ emission of its own business journeys and offers its customers a voluntary CO₂ offsetting option. Each kilometre driven is offset with a payment of 2 Swiss centimes (1.3 euro cents) to the myclimate Foundation, which uses the money to finance certified climate protection projects in Switzerland and in developing countries. In 2008, voluntary CO₂ offset payments were made for 22.3% of the kilometres driven. All in all, 1,590 tonnes of CO₂ emissions from Car-Sharing vehicles were offset with payments of 202,000 Swiss francs (approximately €133,000).

The German Car-Sharing provider einfach mobil GmbH, which offers Car-Sharing in Marburg, Giessen and Kassel, has kept its entire Car-Sharing fleet carbon neutral since August 2007. Here, the decision was not left to individual customers but rather was established by the provider for the total distance driven. The offset payment is built into the standard Car-Sharing fees. Einfach mobil GmbH also works with the Swiss myclimate Foundation which predominantly invests in climate projects that have been evaluated by neutral assessment authorities with the highest certification degree, the gold standard of the international climate protection treaty. That makes it impossible for offset moneys to flow, for example, into reforestation projects whose CO₂ capture is not permanent and where CO₂ can be released again by clearing or burning.

In April 2007, the German Car-Sharing provider cambio started a trial of a voluntary climate fee with its customers. The trial was limited to the Car-Sharing service in Bremen and was to be expanded to all cambio cities after a successful trial. However, at the end of 2007, cambio gave up the scheme because of a lack of acceptance. In this time period, only 37 Car-Sharing customers with 51 authorised drivers had taken part in the trial. That was slightly more than 1% of the customers or authorised drivers in Bremen who were approached.

In a survey carried out at the beginning, parallel to the annual customer survey, all customers were asked to respond to several questions on the topic of voluntary CO₂ emissions offsetting. 314 customers responded. The most significant findings were (cambio 2009):

- More than 52% of the customers felt that Car-Sharing should be supported by the climate fees of other environmental “bad guys” rather than paying themselves.
- While more than 45% found the idea of a voluntary climate fee a good idea, they would already donate to other environmental projects.
- 38% of the customers said that they would only be prepared to pay when personal car owners and frequent drivers also paid. Approximately 30% were undecided on this question and 30% were theoretically prepared to pay even if it was not required.
- More than 50% of the customers were against the idea of cambio paying the voluntary climate protection fee for all kilometres and calculating the costs into overall user fees.
- 45% of the customers were of the opinion that the low number of kilometres driven would make the contribution so small as to be of no benefit to the climate.

In the trial period, 14,465 kilometres with Car-Sharing vehicles from the cambio customers in Bremen were offset. That is less than 0.8% of the kilometres driven by cambio Bremen customers in that time period. With that, those Car-Sharing customers who drove less tended to be the ones who took part in the trial.

5.3 Conclusion: Car-Sharing serves the collective good

In this chapter, we have analytically itemised the different individual effects of Car-Sharing and documented them with research results from scientific studies and customer surveys in several Car-Sharing countries. The research results make strikingly clear that Car-Sharing offers a noteworthy contribution to the reduction of the burden on transport and the environment. When integrated with the eco-modes (public transport, bicycle and walking), Car-Sharing presents a city-friendly and environmentally-friendly car component that is employed selectively and sparingly by its users. To sum up briefly: Car-Sharing contributes to serving the public good in a sustainable transport system.

6. Success factors of the above-average growth in Car-Sharing use

In this chapter, several of the success factors will be described that have, in our experience, contributed to the above-average growth in Car-Sharing. At the top of the list is collaboration with the operators of public transport companies. But the collaboration with businesses and public administrations within the framework of business Car-Sharing is also gaining in importance. The motivation of the partners involved in the successful collaboration will be described, and the mechanisms presented. The significance of political support for Car-Sharing – support that would allow the potential environmental benefits described in the previous chapter to be effective within the reality of urban transport – will be illustrated. We will see that, in some circumstances, compared to car ownership, Car-Sharing is a cost-efficient mobility service.

The enumeration of success factors of an above-average growth in Car-Sharing goes beyond itemising single factors whose individual contribution we have seen in some examples. This is not comprehensive. The most important condition for success is not easy to generalise; it is the personal power of persuasion of the local actors and their ability to bring together effective networks of partners who, together, can take on the task of furthering Car-Sharing.

6.1 The influence of collaboration with public transport companies

Many customer surveys have shown that public transport users are much more easily attracted to Car-Sharing than are die-hard car users. Thus it makes sense that Car-Sharing providers should work in collaboration with local or regional public transport organisations and develop “package deals” to offer to the public.

Scientific research has shown that both partners profit in the end. Through a unified offer, public transport operators have a new tool to help keep customers and maintain customer loyalty. Combined products that are tied to monthly or annual public transport tickets help encourage occasional public transport users to switch to higher value products. Public transport companies also profit from the fresh, innovative image that Car-Sharing offers. Conversely, Car-Sharing providers profit from the larger customer database of the public transport provider and its multiple advertising channels. With their help, Car-Sharing can be promoted at the same time. Active collaboration built on mutual trust between equals is advantageous for both partners and leads to a win-win situation.

In an official letter to its member companies, the German umbrella organisation for public transport companies (VDV) published a recommendation to establish collaborative activities with local Car-Sharing providers (VDV 2004).

6.1.1 Possible components of “package deals”

The advantages for public transport and Car-Sharing customers that result from collaboration between the operators differ from city to city. Collaboration is negotiated by each set of partners and reflects local conditions. Below is a sample of the components of package deals that have resulted from such collaboration.

Package pricing

The most common form of package offer is reduced Car-Sharing fares for regular public transport customers. In general, they're linked with the possession of monthly or annual transport tickets.

- In Cologne (Germany), the Car-Sharing provider cambio rewards public transport season ticket holders with greatly reduced Car-Sharing fares. There is no sign-up fee (a saving of €30), the monthly fee is reduced to €5, the per-journey user fee begins at €1.40 per hour for the smallest car class (from the regular €1.90) and 23 cents per kilometre for the smallest car class (from the regular 30 cents).
- With Stadtmobil Rhein-Neckar (Mannheim, Heidelberg, and Ludwigshafen, Germany), public transport annual or half yearly season ticket holders pay only half of the regular sign-up fee and half of the regular refundable deposit.
- The Finnish Car-Sharing provider City Car Club co-operates with Helsinki's two public transport authorities. Season ticket holders of Helsinki City Transport (HKL) get free access to Car-Sharing participation (a saving of €59) and pay a €2 monthly fee rather than €9.90. Ticket holders for Helsinki Metropolitan Council (YTV) (with tickets of 30 days or more) get a €150 voucher which can be used for any City Car Club costs. The public transport authority and the Car-Sharing provider finance the costs of Car-Sharing rebates by 50:50. Through this collaboration, the number of Car-Sharing users in Helsinki has grown significantly.
- Mobility Switzerland currently offers 15 combo packages created through collaboration with local and regional public transport operators and Swiss Rail (SBB). Season ticket holders of these operators gain access (generally for a nominal surcharge) to Car-Sharing all over Switzerland. The standard annual participation fee with Mobility is also waived. The first of these – with the public transport operator in the city of Zurich, and subsequently the entire region of Zurich – has enjoyed incredible popularity and contributed to strong growth in membership for Mobility. As public transport in Switzerland enjoys high public esteem, the message is communicated to the public that, with the combo package, customers' everyday transport needs can all be met (allowing, of course, that short distances can be covered by the non-motorised modes of walking or cycling).

One of the most important partners of the Swiss Car-Sharing provider is Swiss Rail. SBB's head of regional transport estimates that the passenger volume induced by offering a combination of train and Car-Sharing created a profit of more than 43 million Swiss francs for Swiss Rail in 2008 (SBB 2009).

It is less common for public transport operators to grant preferential terms for their services to Car-Sharing customers.

Joint operations

Public transport operators offer a centrally-located customer centre in most cities where customers can buy their monthly or yearly tickets and receive advice and information. In some cities, this customer centre also advises those interested in Car-Sharing and can sign up new Car-Sharing customers. This is done, for example, at the Üstra customer centre in Hanover. The Car-Sharing provider is spared the need to set up a separate office; instead, it can use the public transport provider's existing infrastructure at a reasonable cost.

Further joint marketing activities

In many cases, joint advertising campaigns are agreed upon by the partners.

- Public transport vehicles travel around cities with eye-catching Car-Sharing advertisements.
- Posters and brochures in public transport vehicles highlight special Car-Sharing offers and new projects (example: Lisbon).
- In their customer newspapers and e-mail newsletters, public transport operators inform their customers about local Car-Sharing news and offers on an ongoing basis.
- In one-off e-mail promotions, public transport operators inform their customers of the new partnership with the Car-Sharing provider or of new Car-Sharing projects.
- Joint advertising campaigns at public transport stops/stations.
- Co-branding (like SBB and Mobility in Switzerland)

Car-Sharing information at public transport stops and in timetables

Public transport operators can also include Car-Sharing information through their normal information channels.

- Details about Car-Sharing services and Car-Sharing stations in any given urban area are found in printed timetables.
- People are made aware of nearby Car-Sharing stations in information provided at public transport stops and also via the integration of this information into the signage of the stations.
- Car-Sharing stations are marked on public transport route maps.

Car-Sharing parking spots on the property of the public transport operator

Public transport operators own property all over urban areas for parking and maintaining vehicles or for personnel to take their mandatory breaks. When these locations are near Car-Sharing customers, the opportunity presents itself, within the framework of the collaboration, to place Car-Sharing cars there. This is especially advantageous in the European countries where Car-Sharing stations are not yet allowed in public space.

6.1.2 Car-Sharing is organised by subsidiaries of the public transport operator

In several European countries, the collaboration between public transport and Car-Sharing providers goes so far that joint companies are established which manage the Car-Sharing service. Examples are the different regional subdivisions of cambio Belgium or the newly-established Car-Sharing service in Lisbon that was initiated by a subsidiary of the public transport operator Carris.

Sometimes the Car-Sharing service is organised by the public transport operator itself. Examples are in Bologna, Italy, where the local public transport operator atc Transporti Pubblici Bologna provides the Car-Sharing service CARATC, and Rome, where the public transport operator Atac S.p.A. organises the Car-Sharing service Roma Car Sharing on behalf of the local administration, or the German Railway, whose subsidiary DB Rent GmbH both sets the framework for the brand DB Carsharing, and also keeps its own Car-Sharing vehicles in some German cities and at key train stations.

6.1.3 Example: Collaboration between the Brussels public transport operator (STIB/MIVB) and cambio Brussels

We would like to single out the collaboration between the Brussels public transport operator STIB/MIVB and the Brussels Car-Sharing provider cambio Brussels as it exemplifies a combination of several of the combined offers described above (Dumont 2007).

The Brussels public transport operator takes its collaboration with other transport providers as much more than just talk; instead it actively lives it in daily operations. This is expressed in the fact that STIB has its own Intermodality Department, whose head, Didier Dumont, also holds the chair of the UITP Car-Sharing platform. At the request of the Metropolitan Region of Brussels, STIB has also participated in the development of the Car-Sharing provider cambio Brussels, and holds 49.5% of the shares of cambio Brussels. The collaboration between public transport and the Car-Sharing operator, together with the political support of the local authorities have been identified as the key factor of the success of Car-Sharing in Brussels.

The result is that the Car-Sharing station network has been built up in close collaboration with the public transport network and stations are highly visible on the maps of the public transport operator. STIB and cambio jointly developed the public communication plan for the complementary services of the two transport companies. They work together on a joint marketing committee, whereby cambio profits from STIB's expertise and know-how in commercial marketing and advertising. The Car-Sharing product from cambio has been fully integrated into the product communication of the public transport company. Collaboration has developed into seamless day-to-day teamwork, and this is reflected in the exemplary growth rate of Car-Sharing participation in the Belgian capital.

Although we have focussed on the capital region of Belgium, the other regions should not go unmentioned. There too, the public transport companies work well and closely with the regional Car-Sharing providers: the Flanders public transport company De Lijn with cambio Vlaanderen and the transport company TEC in Wallonia with cambio Wallonie. In both regions, collaboration encompasses shared fee structures as well as public relations. The public transport companies are also involved as shareholders of the regional Car-Sharing providers.

6.1.4 Mobility packages: the highest level of a joint offer of integrated sustainable urban mobility

In chapter 6.1.1 joint fee packages between public transport companies and Car-Sharing providers were described, as they have been implemented in many locations in Europe. As a further level of collaboration, package offers of sustainable urban mobility in a city or region are brought together on a single card and jointly marketed. While, in many cases, the personal car is not employed efficiently, it is nonetheless able to meet a wide range of mobility needs, and any single one of the eco-mobility modes (public transport, cycling, walking) is only able to meet some of the daily transport needs. By combining the various transport modes, the specific strengths of eco-mobility can be optimised. Mobility packages with a multimodal integrated ticket such as a smart card are the concrete result of optimised co-operation between the various modes of transport; they relieve users of the need to organise their transport and they bundle customer needs into a single card. A welcome side effect is the strengthening of the collaboration between local stakeholders (mobility providers).

To date, there are two such mobility packages in Germany: Hanover and Freiburg. The basic structure of the mobility package is the co-operation of the local public transport authority with the local Car-Sharing provider as a complementary car component. Further partners can also be integrated if they are available and if it is deemed appropriate in each region.

HANNOVERmobil, the combo package offered by the Regional Association of Public Transport Operators of Hanover

The HANNOVERmobil combo package has been available since 2004 – as a pilot project until 2007 and as a regular service since 2007. It integrates an annual public transport ticket in the fare zone of the Transport Association of Greater Hanover (GVH) with access to Car-Sharing as well as discounts from a taxi company, a car rental agency, and a bicycle parking garage in the city centre. A “BahnCard 25” (25% annual discount card for German Rail) is also included.

The cornerstone of the integrated combo package is an annual transport ticket within Greater Hanover – available for individual adults and for business customers as well as for those aged 60+ and for students. For an additional €6.95 a month, this annual ticket can be upgraded to a complete mobility package.

Users of the HANNOVERmobil card have access to 112 Car-Sharing vehicles at 68 stations in seven cities in the region. They save the €79 sign-up fee and the €5 monthly fee, and aren't required to pay the usual deposit.

HANNOVERmobil customers get a 20% discount on taxi journeys with the largest taxi company in Hanover. Customers who want to take a longer holiday journey, rent a small van, or use a car for a one-way journey (within Germany) get a special rate at a car rental agency. Luggage storage in the customer centre of the transport company in the centre of Hanover is free. In addition, a free BahnCard 25 for German Rail (valued at €57) is included, offering 25% off the regular fare within Germany for a year. The value of this card is also taken into account if a customer upgrades to a BahnCard 50 or 100.

All combo card transactions are cashless and are combined into a single monthly “mobility bill.”

Findings after five years of operation

After three years in the pilot phase and a further two years in regular operation, the following findings have been compiled:

- Approximately 1,000 customers have taken advantage of the combined multimodal integrated ticket HANNOVERmobil. This is nonetheless below the provider's initial expectations.
- Customer gain for public transport: more than one in three customers has obtained a new annual public transport ticket in conjunction with HANNOVERmobil.
- Customer loyalty to public transport: Approximately one third of the 1,000 combo package customers have got rid of a car or decided against a planned car purchase.
- The image of the local public transport operator has improved through the combo package.
- Customer gain for the Car-Sharing provider: over 80% of customers were not previously Car-Sharing users.

- Customer gain for the train: approximately 75% of the customers previously had no BahnCard (annual discount card).

Taxi use of the combo package customers sits at about €2 to €3 in sales volume per customer per month – low in total but still far above the average of the general population.

Economic benefit for the public transport company

The chair of the Hanover transport company Üstra, André Neiß, makes the following statement on the economic value of the combo package from the perspective of the public transport operator (Üstra 2008):

- The customer loyalty effect in public transport per customer per year is valued at €60. That is the amount resulting from annual ticket holders deciding against a previously planned car purchase and instead renewing an annual public transport ticket.
- The customer attraction effect adds €35 per customer per year. That is the profit gained by the transport company because public transport users now get an annual ticket in order to take advantage of the discounts offered by the package purchase.
- Of that, €30 per customer per year must be deducted because of the rebate offered on the public transport ticket.
- There remains a profit margin for the public transport association in Hanover of €65 per participating customer per year (currently approximately €65,000 a year).

The conclusion from the perspective of the most important providers of the integrated mobility package: although customer demand hasn't fully met early expectations, both the public transport authority and the Hanover Car-Sharing provider Stadtmobil Hannover are satisfied with the package and its impacts. The name HANNOVERmobil has become synonymous with sustainable urban transport in the region.

RegioMobilCard – the combo package in Greater Freiburg

The combo card for Freiburg is called the RegioMobilCard. Together with the transferable annual public transport ticket offered by the regional public transport association of Freiburg, the main component is Car-Sharing. The cost of Car-Sharing is 20% less than the regular price. With the RegioMobilCard, the investment amounts to €200 (plus an additional €40 registration fee) rather than the standard €350. The combo ticket also offers discounts at the bike station at the Freiburg train station, for bicycle rental, for taxi journeys with one of Freiburg's taxi companies, and for rentals with a local car rental agency and a camper rental agency.

What makes the Freiburg combo ticket (also established in 2004) unusual is that it wasn't set up by any of Freiburg's transport operators or by the regional public transport association, but rather by the city's Car-Sharing provider, Car-Sharing Südbaden-Freiburg e.V. Sales of the combo ticket take place through the Car-Sharing provider, which also accepts the financial risk. The Freiburg public transport company and the regional public transport association participated in the introductory phase of advertising for the combo ticket.

As at spring 2009, approximately 450 users were in possession of a RegioMobilCard in Freiburg.

6.2 Car-Sharing for business

Car-Sharing is not only an interesting and cost-effective way for private users to meet occasional car needs; business users can also profit from it. Car-Sharing can satisfy the vehicle needs of businesses, councils, organisations and associations in a variety of ways:

- Car-Sharing vehicles can replace one or more underused company fleet vehicles. This is less expensive for a company than maintaining cars of its own and eliminates the need for personnel time to care for the vehicles.
- A company owns several vehicles for business purposes or falls back on the use of employees' personal vehicles on occasion. At times of unusually high demand, Car-Sharing vehicles can fill the gap.
- Speciality vehicles are available through Car-Sharing. For example, goods can be moved using a Car-Sharing van while normal business needs are taken care of by the company's own passenger vehicles.
- In some areas, business customers cannot find parking spaces for their company vehicles (or for employees' personal vehicles used for work purposes). Car-Sharing vehicles are available in reserved parking spaces near the business customer.

Car-Sharing does not need to replace entire company fleets; it can also be used as a means of flexibly supplementing company-owned fleets. Nobody would suggest that a field staff member who drives tens of thousands of kilometres annually in the course of his or her job should replace a familiar and trusted company car with Car-Sharing. If, however, several employees share a company car and it is relatively little used overall, Car-Sharing participation can probably be a sensible alternative solution.

Work journeys do not necessarily have to begin with a Car-Sharing vehicle at the station nearest to the work place; they can also start near the employee's home. All the vehicles distributed throughout the station network of the city of the local Car-Sharing provider are available, increasing the flexibility of Car-Sharing use.

For longer work journeys, the longer portion can be done by train. The time in the train can thus be used to prepare for the upcoming meeting. To be mobile locally, the eco-modes of transport (public transport, rental bike or taxi) can be used or, if accessibility is poor, the Car-Sharing vehicle at the train station can be used for the remaining distance.

The replacement of company-owned vehicles with Car-Sharing saves on parking space on the firm's premises allowing it to be better used, for example, as visitor parking.

The motivation of business customers to participate

In Germany, approximately 23 percent of Car-Sharing participants at the various providers are business customers.

The Bundesverband CarSharing e.V., Germany's national Car-Sharing umbrella organisation, published a brochure at the beginning of 2010 that identified nine good examples of the possibilities and potential of Car-Sharing use for business customers in Germany (bcs 2010). The wide range of motivations of different business customers for their commitment to Car-Sharing are also laid out:

- Local authorities are both major employers as well as significant sources of traffic in cities. The Mannheim local authority is representative of the many local governments that not only give Car-Sharing in their city political support, but also use it for its own

work journeys. After a one-year test period, as good participation of various city offices and departments was achieved as that of other institutions close to the city, such as the national theatre, and the political parties represented in the local council. The city parliament has also agreed upon Car-Sharing as its ongoing provider of work vehicles.

- A media firm in Göttingen manages its increasing customer contacts all over Germany with Car-Sharing. They particularly value the flexibility they have to occasionally use more than one or two vehicles at any given time.
- An engineering firm in Berlin, a subsidiary of German Rail, phased out part of its own fleet and uses the Car-Sharing vehicles that are stationed in front of their building. In doing so, they save several thousand euro annually. Sub-sections of the engineering firm that need vehicles for longer periods for field work have kept their own leased fleet.
- A large environmental research facility in Leipzig, at which German Chancellor Angela Merkel completed her PhD, uses Car-Sharing vehicles to get its equipment to the field for field research and to get to project meetings. An off-road multi-purpose vehicle is also part of the regularly-used Car-Sharing fleet. For the administrative manager, the environmental friendliness of the vehicles in a modern Car-Sharing fleet is important. This would be unachievable within the budget constraints of a publicly financed facility that would otherwise have to keep vehicles for many years.
- A non-profit fair trade organisation in Cologne took a similar path of “professionalisation” as German Car-Sharing. An increasing numbers of outside appointments to which materials had to be transported makes Car-Sharing of interest, combined with local public transport and longer distance train use.
- The Hamburg Economic Development mbH uses Car-Sharing when they have consultation in industrial areas which are difficult to reach by public transport. Sometimes they also base their consultation on the availability of the Car-Sharing cars at their front door. They are living proof that economy and ecology are not mutually exclusive for economic advisers.
- The Federal Bureau of Statistics in Wiesbaden used Car-Sharing vehicles more often during the time that their department was spread out over the city due to renovation of the central building. The internal postal service at the Wiesbaden location is still handled daily with Car-Sharing vehicles.
- In Esslingen, the City Initiative, a group organised as a society of individual businesses and tradespeople in the historical city centre, is a member with the local Car-Sharing provider. Through this, its members can use Car-Sharing, which is actively marketed as an added value by the City Initiative in its own member promotions. Since the city centre has an extensive pedestrian zone, for some, a Car-Sharing car is closer than the public parking spaces around the city centre where business owners must park their own work vehicles. This example shows that smaller Car-Sharing providers can also put together an offer attractive to business people.
- In Kiel and Lübeck, the members of two sports clubs use the Car-Sharing provider’s minibuses to travel to their away games and competitions. Even the fact that one club regularly has to take a rowboat along is not a barrier. The problem of the vehicles being reserved by other users at the desired times has not arisen as games and competitions are scheduled and the vehicles booked far in advance. In individual cases, the provider has helped by getting a vehicle from another city and making it available.

Win-win situation for all involved

Business customers get a flexible mobility service whose level of use they can vary according to vehicle and journey need. With the monthly bill, they receive a detailed cost summary of all journeys, which they can then allocate to individual departments or projects internally as needed.

For Car-Sharing providers, business Car-Sharing use has the advantage that, as a rule, business customers need the Car-Sharing vehicles at different times to the majority of private customers. While business customers mainly need vehicles on weekdays during the day, peak times of private demand is mainly evenings and weekends. Thus private and business uses generally complement each other well. Each vehicle is exploited to better advantage through an optimal combination of business and private users.

For the general public, this has the advantage that more mobility by car is achieved with fewer vehicles and thus less space is needed for parked cars. Private Car-Sharing customers also profit from a larger choice of vehicles near them when business customers are also located in their neighbourhood. That increases the attractiveness of the Car-Sharing service for the private user as well. In favourable cases, business use can lead to Car-Sharing stations also being offered in neighbourhoods in which private customers alone would not justify a vehicle being provided.

Further examples of Car-Sharing services for business customers are laid out in the momo project Car-Sharing fact sheet number 4 “Business Car-Sharing”.

6.3 Collaboration with communities and regions

Local administrations and community groups are important allies of Car-Sharing providers in the development of their service. It is thus significant that communities are gained as partners early. Collaboration with communities can span different areas:

- Local government is often an important employer in the city or community. The multiple work journeys made daily are often undertaken with vehicles from a city-owned fleet which is not always exploited to its fullest potential. City administrations should thus be obtained as business Car-Sharing customers, allowing them to benefit from the potential financial relief realised through Car-Sharing. The additional Car-Sharing services that will likely be added because of this would benefit Car-Sharing users outside of business hours as well.
- As a measure that has the potential to support various aspects of local planning, Car-Sharing should receive a positive reception and political support.
- An infrastructure measure important for the development of Car-Sharing is the provision of vehicle parking spaces at appropriate locations near to customers. When it comes to parking spaces in public street space, communities must agree to the designation of the stations. This can be made possible either by the national legislation assigning this authority to communities or possibly by giving the communities the legal leeway needed to plan to the advantage of Car-Sharing services.
- Last but not least, the political support of a local council raises the profile of Car-Sharing and opens doors for the provider to other potential Car-Sharing participants.

While city administrations first feel the advantages of the collaboration in their own budgets – and possibly in reduced parking pressure in front of their own buildings – the aim of gaining political support for Car-Sharing is the common good of the community and its inhabitants.

In the following section, the exemplary development strategy of Greater London, the Car-Sharing action plan in Bremen and the support for Car-Sharing in Italian cities will be focussed on and illustrated.

6.3.1 Car-Sharing development strategy of Greater London

A particularly concrete and successful implementation of a political development strategy is currently taking place in the metropolis of London. Transport for London (TfL), the central transport co-ordination and planning agency for Greater London, which reports directly to the Mayor of London, adopted its “Car Clubs Strategy” in spring 2008 (TfL 2008). The stated goal of the development strategy is to bring the (currently in 2009) five commercial Car-Sharing providers to market readiness by 2011 through political support. With this, the Car-Sharing providers should be in a position to contribute to the transport policy reduction goals for Greater London. TfL’s ambitious expectations of the Car-Sharing providers are:

- that they play a role in the reduction of traffic congestion and parking pressure in residential areas and at work locations,
- that they support public transport modes in the further development of their transport services,
- that they ensure the opportunity for the population of Greater London to participate in social activities without increasing car traffic, and
- that they contribute to relieving the burden on the environment and to the reduction of traffic-related air pollution.

Car-Sharing providers are expressly mentioned as part of the transport policy strategy of Greater London, which should enable economic growth without the usual negative by-product of an increase in traffic. In doing so, it becomes the first in Europe to use regional policy to assign such an ambitious task to Car-Sharing – a task that would be impossible to accomplish without an equally ambitious politically-supported development strategy.

Before the development strategy was set up, TfL commissioned studies of the effectiveness of Car-Sharing services and surveys of users and potential interested parties whose findings were presented in the two previous chapters of this report. They come to similar findings as studies in other advanced Car-Sharing countries.

The components of the development strategy of Transport for London

The Car-Sharing strategy of TfL is made up of the following components, that combine to present a cohesive development proposal for Greater London:

1. To begin with, TfL explained its Car-Sharing strategy in many public workshops and events and informed citizens on the uses of Car-Sharing.
2. TfL published guidelines that assigned the affected players (TfL, the London boroughs, residential building firms and urban developers, Car-Sharing providers) their respective rôles in Car-Sharing development.
3. Only Car-Sharing providers are supported which possess accreditation from Carplus, the national non-profit organisation for responsible car use. There are currently four

such commercial providers. This should ensure that only Car-Sharing services are supported that fulfil certain quality requirements and are not simply traditional car rental services.

4. The boroughs put out a call for tender for Car-Sharing services for their respective territories. TfL is supporting them in this until 2010. The winner of the call for tender will receive subsidised Car-Sharing parking spaces in public street space from the borough. The idea is that, with the multitude of calls for tender in the 33 inner and outer boroughs, all providers should be up and running, forming a patchwork of development areas for the individual providers that are distributed as fairly as possible. At the end of the period of calls for tender, Car-Sharing service should further develop in a free competition among all providers. In a call for tender, unsuccessful applicants are nonetheless invited to pursue parking spaces on private land, and thus to expand in the given borough. If a call for tender does not lead to the desired success with the selected Car-Sharing provider, it can be reversed and re-done.
5. Through its publicity work, TfL ensures the public acceptance of the reallocation of general-use parking spaces in public street space to reserved Car-Sharing parking spaces. The reserved Car-Sharing spaces are not to be located where free space is most easily available, but rather where the demand of existing or potential users is greatest.
6. The local authorities ensure that the reserved Car-Sharing parking spaces are not occupied by illegal parkers.
7. In 2007/2008, with the help of Carplus, TfL developed a special logo with which Car-Sharing stations in public street space are labelled. This increases the visibility of the Car-Sharing service for the not-yet-user and helps to market Car-Sharing as a semi-public mobility service. With this logo, Car-Sharing vehicles are marketed as “pay-as-you-go” cars, or vehicles for which you only pay when you actually use them.
8. Urban development projects and home builders are required to integrate Car-Sharing services into their new buildings. They will be supported by TfL in the development of car-reduced projects in which car mobility is achieved through Car-Sharing.
9. The Car-Sharing strategy is incorporated in other transport policy goals in Greater London. This includes furthering public transport as well as supporting non-motorised transport and containing car traffic in the city centre through the congestion charge. Car-Sharing vehicles are not exempt from the congestion charge unless they possess a particularly low emission standard; however, the costs of the congestion charge are included within the normal Car-Sharing tariff and do not have to be paid separately by Car-Sharing customers when they enter the congestion charging zone. As with the fixed costs of car use, the burden of the cost of the congestion charge is spread amongst the daily users.
10. The costs of the Car-Sharing strategy will be financed by TfL out of income from the congestion charge. This makes decisions on financial support for the strategy easier for the political committees.
11. TfL advocates the idea of Car-Sharing services being integrated in the public transport electronic access card (Oyster card) and public transport’s other marketing channels.
12. Car-Sharing providers should intentionally remain private companies and not part of a mobility service in public ownership. The time-limited support programme will bring

commercial Car-Sharing providers in London to market-readiness by 2011, after which they should be in a position to accomplish further appreciable growth on their own. The support of private companies is justified in that they will provide a notable contribution to the public sector and the general well-being of the population.

The success of the development strategy in Greater London

The success of the Car-Sharing development strategy in Greater London can be seen in the number of participants and vehicles in Car-Sharing in Great Britain with, by far, the most significant and dynamic development taking place in London. While there were only 32,000 Car-Sharing participants registered in Great Britain at the end of 2007, this number doubled within a year to more than 64,000. At the beginning of January 2010, nearly 113,000 Car-Sharing participants were counted in Great Britain, 86.5% of whom were registered with a provider in London. This development, which can be traced back substantially to the Car-Sharing growth in Greater London, is a striking demonstration of how much the political support of Transport for London and the London boroughs positively affected Car-Sharing services in the British capital and brought them out of their niche rôle within a very few years.

Figure 6.1 shows how the participant numbers in Great Britain in the period from the end of 2007 to the beginning of 2010 also performed an impressive increase as a proportion of the population, exceeding the trend of Car-Sharing development in the rest of Europe. The scenario presented in chapter 2.3 was used in determining this (state of the remaining countries and the trend line as at the beginning of 2009).

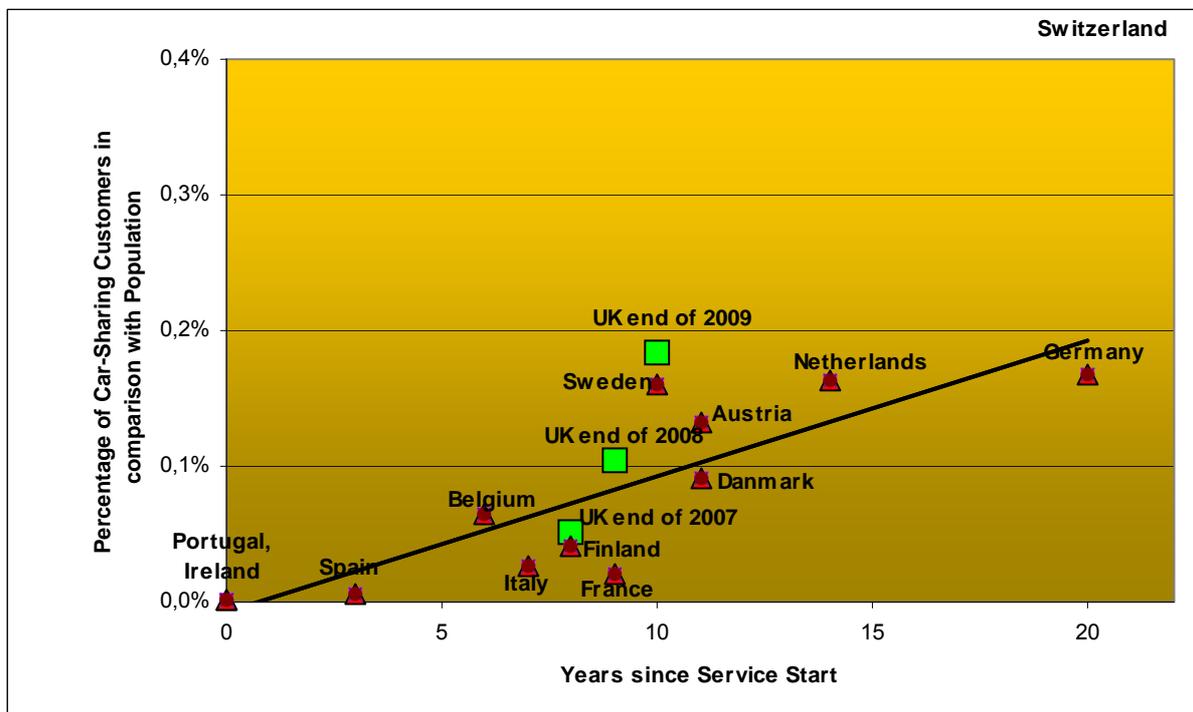


Fig. 6.1: Success curve of Car-Sharing development in Great Britain (London) in the last three years

6.3.2 Car-Sharing Action Plan for Bremen (Germany)

Support for Car-Sharing as a measure that both improves the environment and reduces traffic congestion can be implemented through its integration into a variety of local planning processes. Car-Sharing can, for example, be integrated into climate protection or air quality planning, serve as a support strategy in transport planning, or be included in city development plans. Local councils can also establish and implement Car-Sharing development plans as such.

The momo project partner the Free Hanseatic City of Bremen agreed to such a Car-Sharing development plan in autumn 2009, called the Car-Sharing Action Plan for Bremen (Bremen 2009a; Bremen 2009b). It is the first Car-Sharing development programme established by a community in Germany and contains, among other things, the following components:

- Parking planning should support Car-Sharing station planning and appropriate locations for new stations in public street space should be predefined. Both the largest potential demand as well as the greatest potential for improvement are expected in residential and mixed-use areas in the city centre.
- An anticipated federal law will provide the secure legal framework needed to empower local councils. The city-state of Bremen is playing an active role in initiating and accelerating the legislative process.
- Collaboration between the city's public transport, which is operated by a city transport association, and the Car-Sharing operators in Bremen will be improved. To this end, the shared product offerings will be expanded and targeted marketing carried out.
- Target group-oriented awareness and information campaigns employing focussed measures will increase the level of information and address (among others) the following target groups: workers, school children, children in kindergarten.
- Car-Sharing for the local council's own work journeys should be established in more government departments (local councils as business Car-Sharing customers). In co-operation with the chamber of commerce, other businesses should also be made aware of the possibilities of Car-Sharing to optimise their own fleet management.
- New construction will be carried out in collaboration with Car-Sharing providers so that the number of parking spaces built can be reduced.

The goal of the action plan is to have at least 20,000 Car-Sharing participants in Bremen by 2020, thus achieving a visible relief on the pressure for street space.

6.3.3 Support of local councils in Italian cities

In Italy, many communities and regions participated in the founding of their regional Car-Sharing providers. This was promoted by the national co-ordination point for the development of Car-Sharing, the Iniziativa Car Sharing, and its support through the Italian Environment Ministry. In several cities, communities are directly involved in the regional Car-Sharing organisation.

Political support can be seen in the preferential treatment given to Car-Sharing vehicles in many Italian cities:

- They have unrestricted access to the low emission zones in city centres – established because of poor air quality levels. Regular car traffic may enter only within given time periods.

- Car-Sharing vehicles may use reserved bus lanes, bringing them through the worst congestion areas of the city more easily.
- They can park free of charge in the “blue zones” of the city centre.

Examples of such political support through local transport policy are found in Turin, Venice, Bologna, Rimini and Modena.

In addition, the councils in many Italian cities use Car-Sharing for their employees’ work travel.

6.4 Support programmes at higher political levels

The previous chapter presented political support at the local level; this chapter concerns itself with support for Car-Sharing through higher political levels (countries or regions). This difference is not always clear cut; Greater London, an example of community support, is larger and more populous than some higher political levels in other countries.

Significant infrastructure support for Car-Sharing development is the provision of Car-Sharing stations in those neighbourhoods and street spaces in which Car-Sharing operators do not have space on private land or cannot rent enough space. This is related to political support at higher levels of government in that national legislation can put communities – who understand the local conditions best – in a position to make the necessary public street space available to Car-Sharing operators on their own authority. Failing this political empowerment, this can become a barrier to Car-Sharing growth, as is illustrated in chapter 7.

6.4.1 Example: Italy

Ambitious Italian support programmes

Within Europe, Car-Sharing enjoys its most comprehensive state support in Italy. Because of persistent environmental problems in large Italian cities, national programmes were approved as early as 1998 for the development of environmentally-friendly mobility services in cities, including Car-Sharing. The programme – and thus national support for Car-Sharing – is the responsibility of the Italian Environment Ministry.

Its first concrete achievement was the establishment of the national co-ordination point Iniziativa Car Sharing (ICS). The intention of ICS was both to advance the development of Car-Sharing services in Italian cities and also to ensure that a unified technology system and service are made available nationwide, thus ensuring the interoperability of the various services in the cities and regions.

In the start-up phase of each individual Car-Sharing service – generally organised by local authorities, sometimes in collaboration with the local transport operator – ICS assumed up to 50% of the investment cost. To date, the Italian Environment Ministry has invested approximately €9 million in the development of Car-Sharing.

This state support for the development of Car-Sharing in Italy has meant:

- close, formal support for Car-Sharing is given through city governments and the provinces,
- the integration of Car-Sharing with public transport is ensured,

- all Car-Sharing services supported by ICS function using the same Car-Sharing system technology, and
- Car-Sharing nationwide is politically supported as a means of reducing environmental damage in cities.

Italian car scrappage programme benefits Car-Sharing

In some European countries, as a means of boosting a sinking economy – and particularly to support the automobile industry – bonuses are paid to those who scrap their old cars and buy new ones, but no measures are put in place to bring about a positive environmental impact. The Italian government chose another direction: there, the Environment Ministry, in collaboration with ICS, created a scrappage bonus that encourages Car-Sharing participation.

If vehicles with pollution level Euro 0, Euro 1 or Euro 2 are scrapped, the bonus can be used toward Car-Sharing participation: car owners receive free Car-Sharing membership for the first year and pay half of the standard annual fee in the second year. They also receive an €800 Car-Sharing driving credit from the state.

In addition, the Environment Ministry is supporting a pilot project for the adoption of climate-friendly hybrid vehicles for Car-Sharing services. Employees of the General Directorate for Environmental Protection in Rome are testing the local Car-Sharing service for business use.

In Belgium, a comparable car disposal campaign was created at a regional level. Here, the Brussels regional government, the Brussels public transport company STIB, the Car-Sharing provider cambio Brussels as well as a cycling organisation are working together. Car owners who sell their personal car and give back the number plate get a free registration for one year with a Car-Sharing company in addition to a free public transport ticket for Brussels public transport for one year or a voucher up to a maximum value of €470 toward the purchase of a bicycle. Car owners who scrap their car and give back the number plate receive all of the above for two years.

6.4.2 The Swiss “climate cent” benefits Car-Sharing

In March 2005, the Swiss Federal Council decided to collect a “climate cent” on every litre of imported petrol and diesel fuel. Its intent was to exert an (albeit small) directional impact toward the containment of traffic-caused CO₂ emissions. The idea of the climate cent came from the Swiss business community, whose suggestion of a voluntary contribution was intended to prevent the imposition of a significantly harsher carbon tax.

Collection of the climate cent is administered by a Swiss foundation, which uses the funds to finance climate projects – a certain proportion of which must be domestic. At the beginning of 2007, Mobility started a project with the Climate Cent Foundation with the goal of soliciting 50,000 new Car-Sharing customers in the period 2007 to 2012 and bringing about a 30,000-tonne reduction in CO₂ emissions. The goal is to be achieved by strengthening marketing aimed at individual customers and strengthening the consulting team concerned with Car-Sharing for business. With the help of funding from the Climate Cent Foundation a very successful series of TV spots was created advertising “the best car in the world”.

6.4.3 State-supported awareness campaigns

Car-Sharing providers generally do not have generous advertising budgets. Thus support from the state for awareness campaigns that generate public attention is very desirable. First of all, they raise the profile of Car-Sharing around the country and reach people who could not be reached through the limited advertising channels of Car-Sharing providers. Second, ministry-supported campaigns enjoy a higher level of credibility and are taken more seriously.

At the end of 2008, the German state of Schleswig-Holstein agreed to invest €34,000 in an advertising campaign in the state using the slogan suggested by the state Environment Ministry of “1,000 times more car sharing”. If the goal expressed in the slogan is achieved by the campaign, it would mean an increase in users of almost two thirds in the small state. An effective kick-off of the public awareness campaign took place in Kiel in April 2009 with the state Environment Minister opening a new Car-Sharing station. The central component of the campaign is a series of posters with three catchy themes which are displayed in public transport vehicles and at stops.

6.5 Car-Sharing as a cost-efficient service

Car-Sharing can be a cost-efficient service in comparison to the costs of car ownership. This assumes that one does not exceed a certain number of annual kilometres and that the service isn't needed every day, such as for a daily commute to work. This will be explained in more detail in this chapter. A concrete model calculation of costs and examples cannot simply be carried over from one country to another as the cost structures differ from country to country. However, if the Car-Sharing tariffs reflect this national cost structure, the assertions of the comparison will apply to many European Car-Sharing countries.

The model calculation is based on the cost structure in Germany. According to a scientific study commissioned by the German federal Ministry for Economy and Technology, the fixed costs of a car make up slightly more than 60% of annual costs (Hunsicker, Sommer 2009). By far, the largest cost (over 40%) is the depreciation of a car in its first four years. While the fixed costs of a personal car are carried solely by the owner, those for Car-Sharing are distributed amongst many users. In the developed European Car-Sharing countries, on average between 20 and 59 users share each Car-Sharing vehicle; they bear the burden of the fixed costs together through their user fees.

In order to illustrate the difference in cost structure, the following two figures contrast the costs of a company car with those of a business Car-Sharing user in a comparable cost category. This cost comparison is carried out on two different vehicle models: a Ford Fiesta compact car and an Opel Astra estate car. For the personal cars, the fixed costs include the purchase price and financing costs balanced out over four years as well as vehicle insurance – including comprehensive collision insurance – and annual vehicle taxes. The costs were taken from the Internet site www.autobudget.de (as at January 2010). Discounts that a company may get from a dealer with the purchase of a new company vehicle were not included. An annual total of 12,000 kilometres was assumed.

In the graph, the fixed costs of vehicle upkeep were applied in the first month of each respective year. Following this theory, the owner of a company car between one and four years old must pay between €3,300 for a compact car (a Ford Fiesta) and €4,200 for an estate car (an Opel Astra) before having driven a single kilometre. The cost structure of Car-

Sharing is completely different. Here, users pay no, or minimal, monthly or annual participation fees. The corresponding fixed costs for the example given would come to €384. The costs of Car-Sharing arise (almost) exclusively through use.

For the calculation of the Car-Sharing costs, the “pro tariff” of the Car-Sharing provider cambio in Germany was drawn upon; it is applied for those who drive a lot and includes a somewhat higher basic monthly fee and lower user fees. The monthly participation fees are based on five employees of the business customer. For 40 weeks of the year, a Car-Sharing vehicle is booked twice a week for six hours and driven 150 kilometres each time. Together, this adds up to the 12,000 annual kilometres that the five authorised drivers from the hypothetical business Car-Sharing customer drove. In the cost comparison at the end of the year, the Car-Sharing use for the compact car (Ford Fiesta Econetic) recorded an advantage of almost €950, while the difference for the Opel Astra estate car came to almost €1,100. This cost difference comes about exclusively because with Car-Sharing, the high fixed costs are shared by many users.

Despite the 12,000 annual kilometres, Car-Sharing costs in our example do not add up to the costs of a company car. One could argue there is a strong probability that a company would get a rebate from their car dealer on the purchase of a new car. In our model calculation, this rebate would have to be in the range of approximately €4,000 for a small car and about €4,300 in the compact class in order for the company-owned car to match the costs of Car-Sharing use at the end of four years.

For private customers, the cost comparison with the same provider comes out somewhat worse because business customer rates are lower than those for private customers. Nonetheless, the rule still applies that 10,000 to 12,000 annual kilometres with the Car-Sharing vehicle could come out less expensive if one does not need the use of a car on a daily basis.

The cost argument can be used very convincingly in soliciting new customers; however, its persuasive power on potential customers becomes even more effective, the more these fact-based arguments are available and the emotional connection to the personal car slips into the background. Many Car-Sharing providers offer a cost calculator on their Internet pages that enable customers to make a clear comparison with their own patterns of use.

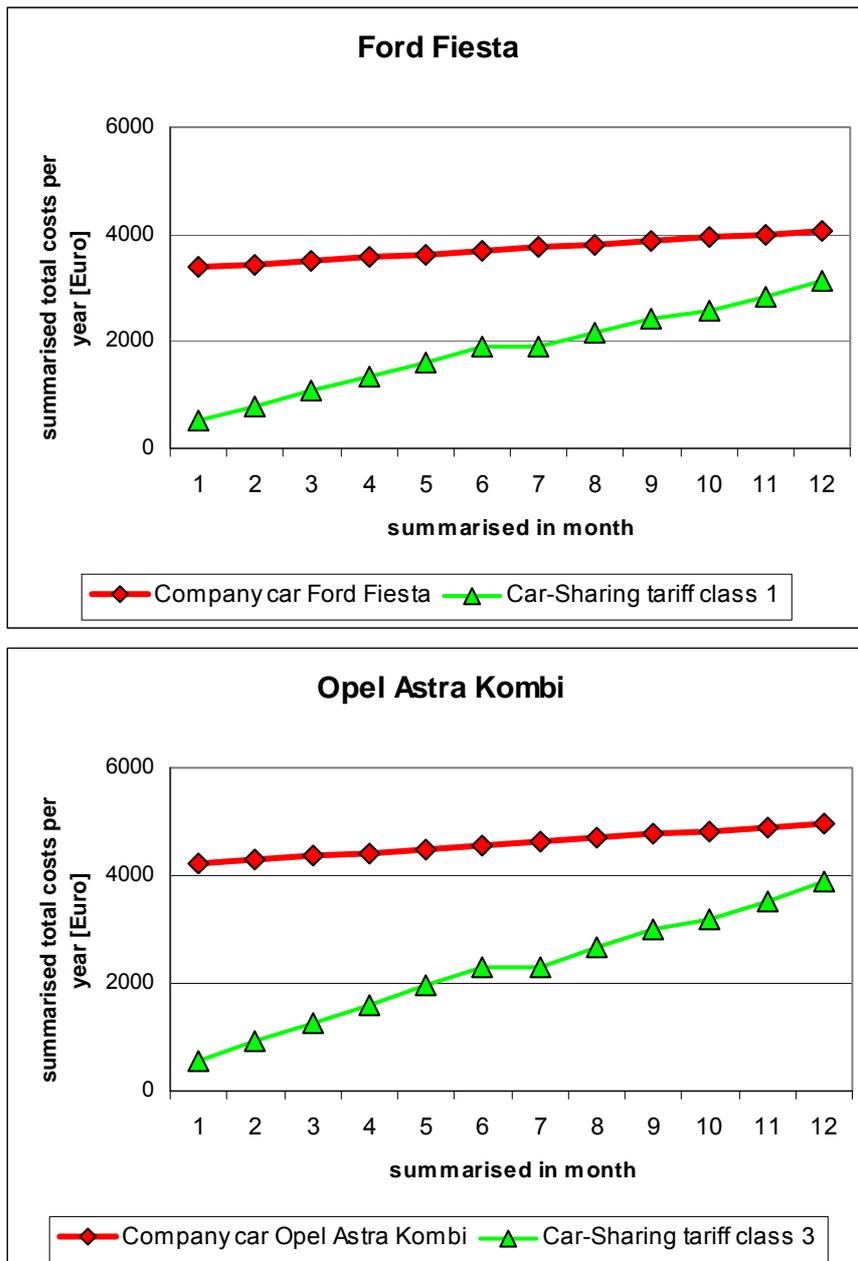


Fig. 6.2: Cost comparison of the annual costs of a company-owned car versus Car-Sharing use

6.6 Modern system technology

Without the implementation of well-developed Car-Sharing technology, the success of modern Car-Sharing systems would be unthinkable. It is what guarantees the dependability and simplicity of the service for users and operators.

Modern Car-Sharing system technology distinguishes itself in that it increasingly removes bothersome tasks from the customers. While, in the early days of Car-Sharing, participants were charged with tasks of recording and checking at the beginning and end of each use, these have been taken over to a large extent in many systems by the system itself. The on-board computer in Car-Sharing vehicles registers figures from the odometer at the beginning

and end of a use without needing the customer to record them as well. The same goes for the time from the beginning to the end of the journey. The on-board computer then passes this information on to the accounting system automatically.

Every modern Car-Sharing system these days has both a staffed 24-hour telephone centre to take customer bookings (and other wishes and complaints) and an automated Internet portal through which they offer those same services. There are almost always at least two methods available for customers to make reservations. In addition, some booking programmes are set up as intelligent systems that, after a few reservations, detect the preferences of individual customers with regard to favourite station, vehicle types as well as "Plan B" priorities in case the desired option happens not to be available for the next journey.

It is also now technically possible that the booking and access systems of different Car-Sharing providers can communicate with one another, thus enabling cross-use between customers of different providers. Whether this communication between different providers' systems within a country or internationally is actually put into use is more a question of preparatory system work and the associated costs as well as the will of the providers to collaborate.

Something which is already technically possible, and a task for the near future, is to make the electronic systems of Car-Sharing providers and public transport companies compatible with one another so both the monthly or yearly public transport ticket and the access medium to the Car-Sharing system can be integrated in one electronic card. Contributing in the steps toward this integration is the task of work package WP3 in the momo project.

7. Constraints to Car-Sharing development

This chapter summarises factors that impede a faster expansion of Car-Sharing and a faster growth in customer numbers and their effects. The responses to the Europe-wide survey of Car-Sharing providers – based on respondents' subjective experiences – are summarised (see chapter 3). Findings from Car-Sharing and other mobility research are also referred to.

In the “advanced European Car-Sharing countries,” forecasts of Car-Sharing market potential have, to date, come nowhere near to being achieved. Combined, this market potential would result in tens of millions of Car-Sharing users in Europe. There are rational reasons explaining the fact that nobody anywhere has come close to reaching the potential. In addition to individual local circumstances, the generalisable constraints and barriers to faster growth in Car-Sharing are described.

The constraints and barriers are divided into three sub-areas. First are the political contradictions of environmentally-oriented transport policy which is, of course, realised differently in different European countries. Second are the economic conditions under which Car-Sharing providers operate. Third are the personal reservations of road users toward the idea of shared car use and individual perceived barriers that impede rational choice of transport modes.

This report only addresses what we considered to be the most representative constraints and barriers to a rapid expansion of Car-Sharing. Other factors not mentioned here may also exist in individual European countries.

7.1 Political constraints

7.1.1 Car-Sharing stations in public street space

One fundamental component of Car-Sharing infrastructure is the reserved Car-Sharing stations at selected locations where customers pick up and return vehicles. These should be located as near as possible to the homes of individual customers and to the work locations of commercial customers. Customer surveys have established that a walking distance of 500 metres from the customer is ideal. Beyond 700 to 800 metres, customer take-up is markedly reduced. For customers who travel to Car-Sharing vehicles from farther away by other forms of transport, it is useful for the stations to be reachable by public transport or by bicycle.

Depending on the legal situation and support from the local administration, the distribution of stations in a city or neighbourhood can act as either a barrier or encouragement for growth in Car-Sharing customer numbers:

- **Major constraint:** national legislation which does not allow the designation of Car-Sharing stations in public street space, as is the case in Germany, Austria, and Switzerland. Because of this, in some cases Car-Sharing providers cannot build new Car-Sharing stations in densely-built areas near city centres where, from the perspective of attracting new customers, they are most urgently needed. Local authorities give up due to the lack of any legal basis upon which to build.

As justification for declining to lay the national legal groundwork, lawmakers claim that public street space is a limited resource that must be available to all road users. Offering special privileges to certain groups is applied as sparingly as possible. In addition, the fear is sometimes expressed that the introduction of an exception for a

particular group, such as Car-Sharing providers, will bring on a flood of similar requests from other groups.

- **Medium constraint:** national legislation does not specifically allow Car-Sharing stations to be designated in public street space, but it also does not expressly prohibit it. Co-operative local authorities interpret this using their own discretion to establish Car-Sharing stations in public street space. This is handled in this way in Helsinki and in large Italian cities for example. In this situation, several German cities have interpreted the existing legal status creatively, making exceptions and identifying authorisation possibilities in individual cases. In Cork, Ireland, the establishment of Car-Sharing stations in public street space was allowed as a time-limited experiment in order to gain the experience needed to develop nationally-supported legislation.
- **Minor constraint:** national lawmakers have turned over to local authorities the right to determine who can make a claim to public street space. This is the case in Belgium, the Netherlands and Great Britain. There, the local council, generally together with Car-Sharing providers, decides where new Car-Sharing stations should be established.

In no case, however, is the local council obliged to designate public street space (in the requested locations). The authorities decide on a case-by-case basis according to the criteria of local conditions and political stipulations.

The experience in the European countries in which Car-Sharing providers are allowed to establish stations in public street space is overall exceptionally good. Fears such as those expressed by sceptical lawmakers in the European countries that have thus far declined to introduce stations have not materialised.

7.1.2 **Contradictory political signals caused by short-term thinking and an apparent desire to be seen to be doing something**

In most European countries, Car-Sharing is recognised in transport policy as an environmentally-beneficial and climate-friendly mobility service. The better the positive effects are documented and communicated, the sooner Car-Sharing will also gain support from politicians.

Even such support does not, however, prevent setbacks. This was demonstrated clearly at the beginning of 2009 when, in the face of the financial crisis and a concurrent drop in new car sales, several European countries decided to set up massive support programmes which were worth billions of euro and which were entirely incompatible with officially-declared medium and long term transport and environment policies. The scrappage schemes established in several European countries are examples of this. The bonuses offered new car buyers subsidies worth thousands of euro and were pushed through without any strong environmental conditions being placed on them.

In many countries, users of environmentally-friendly transport modes walked away empty-handed, receiving no financial support within the framework of these national car manufacturer support campaigns. Car-Sharing providers also did not benefit. On the contrary, in spring 2009, they were negatively affected by longer than usual delivery times for the small cars typically used by Car-Sharing providers.

The moment at which owners of older vehicles are thinking about getting rid of those vehicles is an ideal time to make changes in established mobility behaviour. In many cases, people were aware of the existence of Car-Sharing services, but their motivation to make a change

was always lacking. Getting rid of an old car creates an ideal opportunity for people to register for Car-Sharing services. The scrappage scheme, by subsidising car sales, clearly did a disservice to Car-Sharing providers through its counterproductive influence on the recruitment of certain customer groups. The “bargains” offered by the state in the form of cash for the purchase of a new car were too alluring. Even if it is difficult to prove concretely, the lower growth in German Car-Sharing customer numbers in the first half of 2009 (as compared to the previous year) suggests that the German scrappage scheme came at the cost of Car-Sharing development.

7.1.3 Hidden subsidies of car ownership and driving

The Car-Sharing fee system is set up such that costs are laid out very transparently and no incentive exists to use a car more than is necessary. In contrast, the costs of car ownership and driving are obscured by hidden subsidies (which also indirectly affect Car-Sharing).

External costs of car ownership and driving

On the one hand, there are the external costs of car ownership and driving. External costs of transport are those costs that are caused by, but not paid for by, drivers. Instead, they are imposed on the general public. Among these are environmental costs, the consequences of air and noise pollution, and encroachment into natural areas. Because these costs aren't paid for directly by the driver whenever he or she drives, the result is an underestimation of the costs of car driving as compared to transport modes that generate fewer external costs. An estimate by the German Federal Environment Agency calculates the average external environmental cost of private car use in Germany at 2.9 cents per vehicle kilometre (UBA 2007). If this were applied to fuel costs, this would mean an increase in the petrol price of about 37 cents per litre. That's an order of magnitude that would have a noticeable impact on the amount of driving done in personal vehicles, as the market-induced petrol price increase of 2008 showed. Drivers would then become much more aware of the cost efficiency of Car-Sharing. Higher visible costs of private vehicle use would better highlight the cost efficiency for road users of Car-Sharing.

Government fees as financial instruments

Very little financial direction is provided over state fees for new (or nearly new) cars in European countries. A comparison of 27 European countries showed that the state-determined total taxes for a personal car in the first four years add up to between €840 per year (in Romania) and €4,600 per year (in Denmark) (DIW 2009). A compact car with a petrol engine travelling 15,000 annual kilometres was used as a point of comparison. In the countries with above-average tax levels, vehicle licensing fees play a particular role. They account for €2,650 per year in Denmark,³ €1,590 per year in Norway and €1,040 in Ireland. Above-average overall taxes on car ownership are also levied in Belgium, Finland, Malta and the Netherlands.

Such taxes noticeably influence the decision to buy a new car. Conversely, below-average licensing taxes, no licensing taxes at all, or overall state taxes can provide fiscally preferential treatment to private car owners.

³ The cost of vehicle registration is spread out over the first four years of ownership of a new vehicle.

Tax incentives for company vehicles

In business, it has become increasingly popular to purchase company cars not only to meet work-related mobility needs, but also to serve as bonuses and incentives for employees above a certain level. The tax system supports the purchase of more or less privately-used company cars with generous rules, making it more difficult to introduce rational company car use models in the form of business Car-Sharing.

7.1.4 Faith in technology is stronger than awareness raising about mobility management

In political circles, the hope is widespread that modern vehicle technology will solve our current traffic-induced problems. In the past, this has led to, among other things, the willingness of EU policymakers – and also national legislatures – to accept self-regulation in the automobile industry for the reduction of fuel consumption and related CO₂ emissions. In contrast, accompanying measures such as awareness raising among drivers through mobility management and information campaigns were carried out half-heartedly if at all.

7.1.5 Integration of Car-Sharing with the “eco-modes” of transport

Car-Sharing is designed throughout Europe as an integrated service with the so-called “eco-modes” (public transport, cycling and walking). The fee structures of Car-Sharing are generally tailored so that Car-Sharing use is less expensive than driving a new personal car so long as one doesn't need a car every day. For many private Car-Sharing customers, this supports an attitude to driving in which Car-Sharing use is combined with the eco-modes for everyday travel.

It follows that any stimulation of the environmentally-friendly modes of transport also benefits Car-Sharing. The more highly the environmentally-friendly modes of transport are regarded by the general public and by local or regional policy, the more Car-Sharing also profits as the general population is made aware of the advantages of combining modes.

Conversely, constraints and barriers in the design and further development of the eco-modes are also detrimental to Car-Sharing. This is expanded upon in the comments of the Bundesverband CarSharing e. V. (German federal Car-Sharing umbrella organisation) on the EU Commission's green paper “Toward a New Culture of Urban Mobility.” This barrier also affects the political level in that the alternatives to car use are not valued highly by national transport policy and are thus insufficiently supported. This, in turn, also has an impact on the attitudes of all road users.

7.2 Economic constraints

The economic conditions under which Car-Sharing providers in the individual European countries operate are too different to be covered in the context of this report. Nonetheless, it should be mentioned that the financial crisis (see section 7.1.2) – because of bank speculation and the sales crisis in the car industry – has taken a toll on Car-Sharing operators.

In the period after the emergence of the bank crisis, Car-Sharing operators had an even more difficult time than usual obtaining credit. In addition, the value of vehicles depreciated substantially after only a few years in Car-Sharing fleets. For leasing vehicles, the consequence of the decline in the value of used cars was that, following a system-induced lag, lease payments rose steeply, making the financing of new vehicles significantly more

expensive. For purchased cars, Car-Sharing operators were no longer able to obtain the revenues expected on the sale of vehicles after their removal from the Car-Sharing fleet. This, in turn, affected the financing of new vehicles.

7.3 Individual constraints

7.3.1 Limited or inadequate understanding of Car-Sharing

One of the biggest constraints to growth in Car-Sharing is the limited or inaccurate knowledge of how it works. Some confuse organised Car-Sharing with the informal lending of a personal car among friends and family members, while some of those questioned don't know the difference from conventional car rental.

A study on Car-Sharing carried out in Germany in 2003 by the author of this report also included a representative public survey (Loose et al. 2004). It showed that, even 14 years after the start of Car-Sharing in Germany, only about 15 percent of those questioned could accurately interpret the expression "Car-Sharing" as an organised means of sharing vehicles. Even among those who claimed to know what Car-Sharing was, only about half knew that a Car-Sharing organisation existed in their own city. There is hope that since that time, the level of recognition of Car-Sharing has risen through increased media attention.

But even where, in principle, there is awareness of the existence of a Car-Sharing service, again and again, findings show that this knowledge is inaccurate. Particularly among those who have no personal experience of Car-Sharing use, preconceptions exist with regard to the availability of cars, the dependability of the booking and access systems, and the customer orientation of the system as a whole. Countless surveys reveal significant differences in the way customer-related aspects of the service are rated: Car-Sharing customers generally rate these aspects decidedly more positively than non-customers, who lack experience with the actual conditions of use and rely instead upon biased or inaccurate half-knowledge.

This also applies incidentally to ratings by politicians and planners whose work brings them into contact with Car-Sharing.

Even in Switzerland, where the highest Car-Sharing market penetration in the world exists and where the level of awareness of the lone Car-Sharing provider, Mobility Co-operative, is close to 100%, many people don't recognise how Car-Sharing participation could be useful to them personally. According to reports from providers, a notable percentage of the population still doesn't know exactly what Car-Sharing is.

The transmission of accurate information about Car-Sharing is among the most important public relations tasks of Car-Sharing providers.

7.3.2 The emotional attachment to the personal car

Even if their personal mobility needs were well-suited to it in every way, only a portion of the population would be prepared to choose the combination of the eco-modes of transport (public transport, cycling, walking) together with Car-Sharing. Individual preferences, mobility orientation and the images associated with various modes of transport deter them from seeing shared cars as a mobility option. In such circles, the private car is seen and used not only as a means of transport, but also – or even predominantly – as an image-laden status symbol and an expression of prosperity. In Western society, over the past 65 years, an emotional attachment to car ownership as a socially desirable symbol of prosperity has

developed. In Eastern European countries, this attitude has been adopted in the last two decades as those countries catch up with motorisation. The more significant domestic car production is to the national economy, the more strongly this social image is supported by national policy.

With the diversification of the modern, urban lifestyle, this model of use is gradually breaking down in certain segments of the population. With the gradual integration of post-materialistic values in the lifestyle of the urban population, the principle “use rather than own” is gaining more and more meaning to the point that even the inner circles of car manufacturers talk about how to incorporate this philosophy in their discussions of future business models.

To the outside, however, the principles of the freedom represented by the automobile are still communicated in car advertising; according to the advertisements, only private car ownership provides this freedom and creates the associated positive feelings. Even in times of crisis, automobile manufacturers pay enormous sums to promote this image.

In the first quarter of 2007 (before awareness of the crisis in car sales), the car industry in Germany invested a total of €509 million in advertising. About a third was given out for television advertisements and nearly another third for advertisements in daily newspapers (Automobilwoche 2007). In this period, 717,000 new cars were licensed in Germany (Kraftfahrt-Bundesamt 2007a, 2007b, 2007c). If one were to allocate the advertising budget of the automobile industry to these cars, each newly-licensed car would account for €709 in advertising funds. VW, with an advertising budget of €50.6 million, spent €379 for each car sold in the first quarter. Toyota, with an advertising budget of €59.1 million, put €1,729 of advertising funds into each new car sold.

These numbers are only snapshots of a single quarter, but car manufacturers have used their advertising budgets for decades to nurture the image of their product. Thus it is not surprising that, out of a simple transport mode, a much deeper emotional attachment to the desire for car ownership was created amongst a large proportion of the population – a desire with which no other transport mode can compete. To break through this, and thus to offer Car-Sharing as an appropriate and rational transport choice, will be a difficult task for many years to come.

7.3.3 Limited recognition at the national level of the value of the eco-modes of transport

This point has already been addressed among the political constraints, but when the alternatives to the private automobile in a given country enjoy only a marginal level of esteem among the population, the chances that even a good Car-Sharing service will be successful are marginal. The strength of Car-Sharing is in the fact that it integrates well with the eco-modes of transport. Car-Sharing participation thus only makes economic sense when not all journeys are taken in a Car-Sharing car but rather all transport modes are used based on their particular strengths. One prerequisite, however, is that the experience of the alternatives to the car offer a certain level of quality and enjoy at least a certain level of esteem within the local mobility culture.

7.3.4 Limited or inadequate understanding of the costs of the private automobile

We described above how politics and car manufacturers have a hand in concealing the real costs of personal car use, but car owners themselves also play a role.

For one thing, fuel is often the only cost that car owners consciously calculate. In countries where motorway use fees also apply to private cars, or where congestion fees are charged for entering a certain area of a city, these costs are also likely to be included in mental cost calculations. In contrast, wear and tear, parking fees, annual vehicle taxes, seasonal tyre changes, and other use-related costs are often overlooked in the overall calculation. This leads to an inaccurate estimation by many vehicle owners of the true total cost of car ownership.

In commercial fleet management as well, only recently has the financial crisis led to more accurate and complete cost accounting. It has only been within the past year or two that the expression TCO (Total Cost of Ownership) has appeared regularly in industry magazines, reflecting increasing cost awareness in the face of companies' sinking investment capital.

7.3.5 Higher fixed costs inhibit willingness to use multi-modal travel

The high initial costs of a personal vehicle seriously – and understandably – reduce the willingness of car drivers to choose the most appropriate mode of transport for each individual journey. The depreciation of a new (or nearly new) vehicle is seen as unavoidable, leading to the attitude: “since I’ve paid for the car, I should use it as much as possible.” Such an attitude prevents car owners from considering the specific strengths of other modes of transport for certain journeys at certain times and inhibits an optimised and efficient use of all transport modes. The cost structure of Car-Sharing is exactly the opposite, making it a perfect fit with the congestion-reducing eco-modes.

The basic problem thus becomes how to lure drivers away from the fixed-cost-dominated cost structure of car ownership to clear the way for a greater willingness to use the most appropriate mode for each journey.

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