



D 2.2

Car sharing in Europe

Key technology
& social innovation drivers





This deliverable focuses on a number of aspects to understand how sharing mobility practices are influenced by the arrival of digital technologies, automotive advances, the emergence of social innovation patterns and mobility behaviour and choices.

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Car sharing has huge potential to improve quality of life and traffic conditions in cities. It offers a car at your disposal without the need of ownership and has the potential to reduce the number of cars in cities without reducing individual mobility. The wide spread of information and communication devices (smartphones in particular) and of social media and web platforms, together with the sharing economy that is growing into a cultural consumption approach, are at the basis of this development. Moreover, smart technology has helped to improve the experience of using car sharing, making booking, accessing and using shared transport easier. While car sharing in recent years has witnessed double-digit growth, particularly in bigger cities where the costs of owning a car can be more easily offset, only a small percentage of people actually use it when compared to other urban modes. This leaves a gap, meaning that cities are unable to reap the full benefits of car sharing. While D2.2 intends to give insights on travel attitudes and choices, it should be noted that the importance of individual, social, political, environmental and economic variables in driving the behavioural change towards shared mobility will be studied in WP4.

The first part of the report explores the three types of underlying forces that are essential to understanding the new era of mobility and particularly the future of car sharing. These include technology enablers, such as ICT based innovations and automotive advances; societal changes such as the emergence of new forms of sharing economy practices and Mobility as a Service; and attitudinal and motivational characteristics of citizens with regards to emerging urban transport opportunities.

The analysis showed that both digital technologies and transport innovations hold a great promise for the development of car sharing services, in terms of enhancing fleet management and maintenance and improving user's experience. Moreover, while the arrival of driverless autonomous vehicles represents a unique opportunity for fundamental change in urban mobility, it will only help to reduce the number of cars (reduce car ownership, car

traffic and parking needs) and drastically improve mobility options, if they come as shared fleets integrated with public transport. As automotive advances are reshaping the driving experience - turning drivers into passengers and pulling users at the centre of the mobility ecosystem - people's values, norms and attitudes towards shared mobility are shown to change significantly with the rapid spread of smartphones and new practices of sharing economy. Therefore, new predictors of travel mode choice, including technological and social innovations, are highlighted in the present study to explore the attitude-behaviour gap related to mobility choices.

The second part aims to advance understanding of how car sharing adoption trends are influenced by the evolution of sociodemographic characteristics (population characteristics, education level, income), car ownership rate, mobility split and the use of web 2.0 services (participation in social networks, internet banking and the use of internet for travelling purposes). To do so, we undertook a complementary approach in which we analysed aggregated statistics for a time series in a given area, or the same statistics in different countries and cities. Car sharing data was gathered through different sources, including car sharing operators' websites, newspaper, annual surveys for the different car sharing systems, and statistical data at national and city level.

Results coming from those analyses allow us to state that it is really difficult to find consistent correlations between the car sharing growth and the variables analysed, especially comparing different countries. This is essentially due to the fact that the diffusion of car sharing is still a niche phenomenon compared to other structural changes in European societies related e.g. to demography, car ownership patterns or mobility behaviours. Nevertheless, the methodology of study here presented might be implemented in the future, when car sharing is likely to be more spread. Despite such limitation, comparing trends in different countries related to car sharing diffusion and a range of other factors can be informative. In particular, in the UK the uniform growth of the car sharing is more

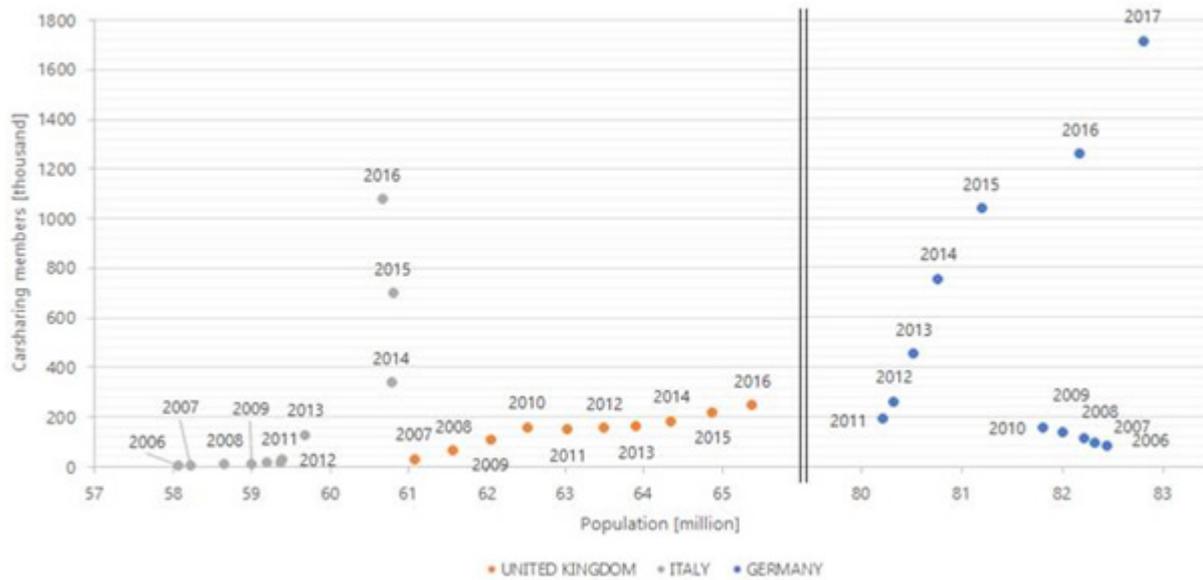


Figure 1: Population in Italy, UK and Germany - car sharing members.

proportional to trends related to socioeconomic factors, while the exponential growth of car sharing seen in Italy and Germany in more recent years is not related to demographic and income trends (Figure 1). In the latter case, such growth is in fact probably due to the roll-out of large car sharing industrial operators about five to seven years ago.

Concerning mobility habits, there is some evidence that the diffusion of car sharing in some countries like Italy might have been facilitated by larger disruptions of mobility habits due to the economic crisis starting from 2008, compared to other countries like the UK where a more static situation is observed. At city level, some cities have a strong penetration of CS in terms of number of members compared to others which have even more CS vehicles (e.g. Rome). Car sharing market and online (Web 2.0) services have experienced significant growth in Europe in recent years. In Italy for example, for every increase in the participation level in social networks, an increase in the number of shared cars can be seen. Whether the participation level (independent variable) has a direct impact on the growth of car sharing, and more specifically on the number of shared cars (dependent variable), we cannot state this on the basis of our research since there might be other variables influencing its evolution.

In addition, it is necessary take into account the available data and time constraints as well as the actual localisation of car sharing services: due to data availability, we compared country-level characteristics with the national growth of car sharing, but car sharing developments are probably much more related to local conditions (the CS national trend is based on data of few cities). As such, a follow-up study could look into other variables (not avail-

able yet) that could be more useful to understand car sharing mobility practices, including the number of trips done with car sharing vehicles and the car replacement rate. The latter could be of especial interest for municipalities and urban planners as it describes how many cars are either replaced by previous car owners when becoming customer of a car sharing service or not purchased (as otherwise when not having a car sharing service).

In the last chapter of the report, a specific analysis of three use cases is carried out with the objective of studying the main drivers, barriers and KPI's to deploy car sharing in urban areas. In Paris, Autolib was chosen as an example of a private-public electrical car fleet that operates as free floating with pool stations. In Bremen, Cambio provides a successful example of a round trip station-based car sharing operator that counts with the continuous support of the local government. And in Barcelona, Drivy offers an example of peer-to-peer car sharing start up that chose Barcelona as one of its internationalization destination. The methodology undertaken to conduct the three case studies combined data from literature analysis and expert interviews. A multi-level perspective is then used to help analyse both the internal (business model and business performance) and external (city/local related) factors shaping the car sharing deployment in these urban areas. Figure 2 presents a summary of the use cases' assessment against internal and external factors, conditioning, to an extent, the success or failure of operations.

It is worth stressing that this study has shed light on the drivers and challenges that car sharing operators face, both from a business model and city level perspective. Indeed, based on the operator's strategy, different impact levels have been highlighted.

Autolib, as a free floating with pool stations scheme, al-

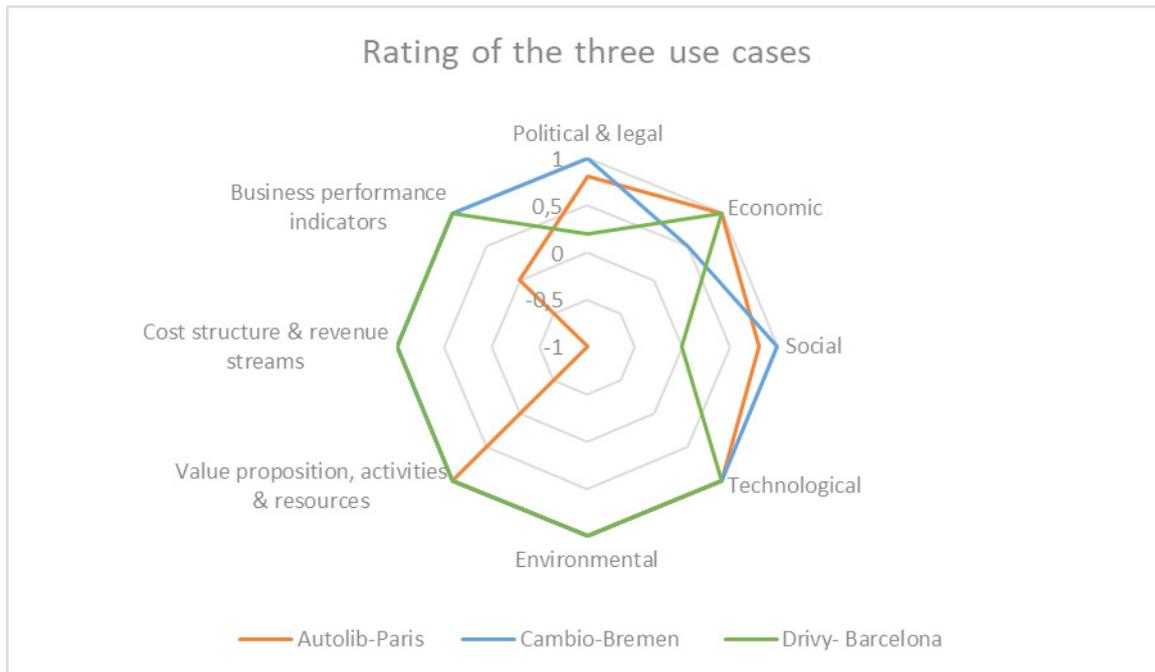


Figure 2: Autolib, Cambio and Drivy's use case assessment.

lows members to take one-way trips and then park the car at a number of charging stations that have ideal locations around Paris. Their strategy is to offer a service that is complementary with public transport, making multi-modal transport easier. According to customers, it has proved successful since it really offers Parisians a more flexible alternative to go from A to B (compared to public transport). However, despite being the world's largest free-floating with pool stations organisation (in terms of vehicle fleet size and the number of subscribers), Autolib continues to postpone its date of financial profitability. Despite the economic model, two drivers are identified for deploying this strategy; First, the density of the city, since it implies a greater number of potential users in the vicinity of each station, which makes it possible to provide a large number of stations, thus a large number of potential journeys. Second, a favourable urban context with a clear necessity of flexible multimodal services and a local authority with a clear shared mobility strategy (and willing to support economically this type of service). These factors question the replicability of this business model for less densely populated areas.

On the other hand, Cambio, as a round trip station-based car sharing scheme, allows members to choose a car from a station and then return it to the same station when they are done. With its wide variety of vehicles and the reliability of pre-reservation (but also the option of spontaneous bookings), their strategy is to offer an alternative to private cars and therefore it has a much higher impact on car ownership than does free-floating car sharing schemes. Three drivers are identified for deploying this type of strategy; First, car sharing is not a stand-alone mea-

sure but is embedded into overall urban development and transport strategies. This implies that car sharing stations are integrated into neighbourhood parking management, new urban developments and public transport. Second, a great effort of communication and awareness needs to be done from the city to educate users on reducing car ownership; and third, a mixed modal split with a strong cycling/walking culture.

And Drivy, as a peer-to-peer car sharing startup, allows its users to rent other people's cars within walking distance of home whenever they need one. Unlike its counterparts, Drivy does not try to capture drivers who need to take short trips inside a city – their strategy focuses instead on having repeat customers, and drivers who are in need of a car for longer trips. As Drivy does not have to provide a vehicle fleet or stations, this business model alleviates upfront costs. Three drivers are identified for deploying this type of strategy; First, to have a good platform; Second, to have credible shareholders and good partnerships with insurance companies; and third, communication effort to capture key customer segments.

Finally, it is worth stressing that being aware of the combination of factors shaping the conditions for car sharing operations in a given city is crucial. Only by acknowledging that internal and external factor that can condition the success or failure of new mobility services, policy makers, businesses and associations can estimate the existing barriers or incentives for transforming the mobility sector. As such, a follow-up study could assess the same business model deployed in two different cities (one big city and a less densely populated one). ●

STARS - Shared mobility opporTunities And challenges foR European citieS – aims to explore and boost the diffusion of car sharing in Europe. It will analyse the car sharing market, measure the benefits of different services and compare their costs, and study user profiles and behaviour.

For the first time, STARS will also look into the implications and impacts of car sharing rather than on the implementation of the service itself. Impacts on other transport modes (private car, bike, walk, taxi, public transport...) and the car industry will be assessed, and impacts in terms of congestion, greenhouse gases, accessibility and social cohesion will be quantified.

Thanks to the knowledge gained in the project, a policy toolkit that includes guidelines and recommendations will be designed. It will help European mobility stakeholders and policymakers make the right decisions and implement the best car sharing services that will maximise environmental and social benefits, making European cities better and more affordable places to live in.



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