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THE POTENTIAL OF CAR SHARING FOR AUTOMOTIVE DEALERS

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Abstract

Should car dealerships include car sharing in their business model? This question is answered by (i) analyzing the car sharing market, (ii) studying the current opportunities and challenges of car dealers, (iii) conducting a survey of potential users of car sharing, and (iv) interviewing automotive industry experts. It is concluded that there is potential for car dealers to integrate car sharing into their business model. However, various provisos and success factors should be taken into account.

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Keywords: car sharing, car dealerships, shared mobility providers, automotive industry

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1 | Introduction

THE CONCEPT of a sharing economy is rapidly gaining adherence among consumers. In a sharing economy, several users share a particular good or service instead of owning it. The sharing economy is altering traditional business models in various industries, which is particularly noticeable in the automotive industry. Instead of owning a good – in this case, a car – customers consume shared goods and services, namely mobility. This has led to the emergence of various alternative new mobility services such as car sharing.¹ In Germany, the number of car sharing users has doubled since 2016 and is expected to grow further (Statista, 2019a). The implementation of car sharing differs markedly between rural (less densely populated) areas and urban (more densely populated) metropolises. While urban mobility is rapidly evolving as a result of the emergence of new forms offering mobility services (e.g., car sharing or ride hailing), these services have seldom been offered in rural areas yet.²

The increased presence of shared mobility does not only alter the business models of car manufacturers but also impacts the business models (and ultimately the survival) of car dealerships, whose success currently depends on the purchase and leasing of vehicles. As a result of new trends in the automotive industry, car dealerships are faced with an expected decrease in sales (Autohaus, 2019). One of the reasons is that a growing number of customers are abandoning vehicle ownership in favor of mobility services. This, in turn, may create an opportunity for car dealers to extend their business models to stay competitive. They can offer shared mobility services that may compensate for the reduction in revenue arising from the decline of vehicle sales. Successful players will be those that look at mobility services as an opportunity, rather than perceiving them solely as a threat to existing business models (Gaul & Wagner, 2017). Due to the growth of car sharing, the integration of this service into the existing business model of car dealers could be a good opportunity to stay profitable in the future.

¹ Car sharing (e.g., SHARE NOW) is a model of car rental where consumers rent cars for short periods of time.

² Ride hailing (e.g., Uber) describes a mobility service whereby a rider hires a personal driver to drive her or him to an exact destination.

Thus, we ask the following research questions: *How attractive is car sharing for potential customers? Is there potential for car dealers to integrate car sharing into their business model?*

It should be noted that this thesis is not studying the details of autonomous vehicles (AVs) and micro mobility (such as bike sharing) due to limited scope and space. Though AVs are important for the future of the automotive industry, they lie far ahead in the future. Micro mobility, though a substitute for cars, can be ignored as far as the research questions are concerned since it is rather an imperfect substitute.

The research questions will be answered by combining different approaches. First, a literature review allows us to analyze the shared mobility industry and to characterize the car dealership market, with a focus on Germany. It will help to gauge the current market and to spot trends. Secondly, the demand side for shared mobility will be analyzed through an online survey, which examines how attractive car sharing is to potential users. The supply side will be approached by conducting semi-structured interviews with several industry experts. They will involve experts working for car manufacturers, new mobility providers, and car dealerships. The interviews will allow us to understand the current automotive and car sharing market, as well as the business model of car dealers. This three-pronged approach should allow us to understand whether car dealers should integrate car sharing into their business model. Concluding, recommendations will be made on how car dealers should react to the emergence of new mobility services.

At the time of writing, we endeavored to ensure the correctness of all information and data. The speed at which this market evolves might outdate it at the time of reading.

2 | Sharing economy

The sharing economy, which is based on the idea of sharing rather than owning goods and services, is strongly impacting today's society and economy (Prieto et al., 2019). It generated an economic model that is characterized by collaborative consumption, peer-to-peer relationships, and on-demand exchange of resources. While traditional economies concentrate on *ownership*, the sharing economy focuses on *access* to resources over a specific time period (Botsman & Rogers, 2010).

This development – driven by new technologies, social motivations, and environmental concerns – enables customers to share goods and services in new ways (Cohen & Kietzmann 2014). It led to the establishment of new web-based startup firms (e.g., Uber, Airbnb), which take advantage of this new sharing concept and disrupt traditional industries (Lee et al., 2018). These startups are offering flexible, customer-oriented, and web-based solutions. Due to the sharing economy’s fast growth, they rapidly gained market share and are currently threatening established firms based on traditional business models (Eichhorst & Spermann, 2015).

2.1 | Shared mobility

The effects of the sharing economy are particularly evident in the automotive industry. In the next years, there will be an increasing shift from vehicle ownership to new shared mobility concepts (Roland Berger, 2018). The term “shared mobility” describes the shared use of vehicles, bicycles, e-scooters, or other means of transportation on an on-demand basis (Shaheen et al., 2015). The increased importance of shared mobility services is in close relation to innovative mobile applications that allow on-demand bookings and reliable GPS tracking. The concept gains popularity as an alternative to the use of private vehicles by offering a broad portfolio of composable mobility solutions. Thus, customers can choose the most efficient mobility service for each situation (BMW, 2019). A global automotive consumer study found that Generation Y wants to choose from a wide range of transportation modes to experience high connectivity and convenience (Deloitte, 2017).³ Mobility services can be divided into multimodal and intermodal approaches. Multimodal mobility solutions describe the different possibilities arising from multiple means of transport. For example, public transport serves as a means of transportation during the week while the bicycle or car are used on the weekend. In contrast, the intermodal approach refers to linking various means of transport for one particular trip. For instance, a person first uses the bicycle to reach the train station, then takes the train, and finally covers the last mile with an e-scooter (Diaz Olvera, 2015).

³ Generation Y, also called Millennials, refers to persons born between 1980 and 1994.

2.2 | Business models of shared mobility

The most common models of shared mobility are car sharing, scooter sharing, bike sharing, e-scooter sharing, ride sharing, and ride-hailing (Appendix 1). To get a better understanding of how car sharing differs from other shared mobility offerings, we define the different models.

Car sharing refers to the shared and organized use of vehicles by a certain number of drivers. In contrast to traditional car rental, car sharing focuses on short-term rental and payment is based on either minutes of use or distance covered (or a combination of both) (BMW, 2019). Car sharing services are either station based or free-floating (see Section 3.1.). The biggest car sharing provider is *SHARE NOW*, a joint venture between Daimler's *car2Go* and BMW's *DriveNow* car sharing services (Hotten, 2019).

Scooter sharing describes the shared use of scooters. The scooters form a fleet that is distributed across a specific area of a major city. They can be booked through mobile applications with payment based on distance or minutes of use. *Emmy* is the biggest scooter sharing provider in Germany, counting more than 250 000 customers in 2019 (Emmy-sharing, 2019).

Bike sharing describes a business model whereby customers can rent bicycles on an as-needed basis. In contrast to traditional bicycle rental firms, bicycle sharing providers focus on short one-way or roundtrip travel. It is available in two forms: station-based, entailing defined pickup and delivery points, and free-floating, whereby users can end their ride and park the bike at any location within a predefined area (Shaheen et al., 2016). The payment is based on an annual, monthly, daily, or per-trip basis. *Jump* is one of the largest providers, operating in 32 cities (Jump, 2019).

E-scooter sharing services are the newest addition to shared mobility. Users can book electric stand-up scooters in predetermined zones through an app. The payment is a combination of fixed base fare and per-minute fee. E-scooter sharing often correlates with the term "last mile", which describes the last segment of a trip. For instance, a driver parks her or his vehicle in an accessible parking lot and then rides an e-scooter to the final destination. Since 2018, the e-scooter business has grown significantly, with *Lime* being the most significant player (Statista, 2019b).

Ride sharing (also known as car pooling) describes trips that are shared by individuals. One person drives a defined route with a private vehicle while carrying other persons to the same destination. Such rides are mostly arranged and billed via third-party websites or apps. The distances are usually long, for instance, driving from one city to another. *BlaBlaCar* is the biggest ride sharing company, operating in 22 countries with 80 million members worldwide (BlaBlaCar, 2019).

Ride Hailing differs from the other models since customers book a professional driver instead of driving themselves. The booking is carried out through an app on an on-demand basis (BMW, 2019). Compared to traditional taxis, ride hailing companies such as *Uber* have a competitive advantage by offering high availability at a lower price. Ride hailing services are characterized by their innovative and transparent approach, providing customer-oriented solutions.

3 | Analysis of the car sharing market

Over the last years, the global car sharing market has grown significantly. Car sharing provides the benefits of a private vehicle without the costs and responsibilities arising from ownership (Machado et al., 2018). Compared to other shared mobility models, it has the advantage of flexibility and independence, while still offering users the opportunity to drive (Deloitte, 2017). Car sharing has experienced double-digit growth over the last years. It is predicted that there will be more than 36 million car sharing users worldwide by 2025 (Statista, 2016). It is most prevalent in Europe, which accounts for more than 50% of the global car sharing market. Within Europe, Germany is the biggest car sharing market, with more than 2.4 million users at the beginning of 2019 (Statista, 2019a).

3.1 | Approaches to car sharing

Depending on the users involved, car sharing occurs in three different forms: peer-to-peer (P2P), business-to-business (B2B) and business-to-consumer (B2C). The latter model follows either a station-based or free-floating approach (Münzel et al., 2017).

3.1.1 | P2P and B2B models

Car sharing has its origins in P2P car sharing involving the shared use of a vehicle, whereby the owner privately provides his or her car to others for a limited time. In its first years, P2P car sharing took place face-to-face among the participating individuals. Nowadays, there are startup firms that connect vehicle owners and users by providing them a marketplace for car sharing. P2P car sharing usually only offers round trips, and payment is based on a daily tariff. In contrast, B2B car sharing models are an alternative to corporations' fleets. It is used by firms that want to provide their employees with a tailored transportation solution that meets their professional mobility needs. Many car sharing providers offer corporate solutions in addition to B2C services. Both models are focused on station-based round trips (Deloitte, 2017).

3.1.2 | Station-based and free-floating B2C car sharing

B2C car sharing is the most widespread and popular model. It can be categorized in station-based and free-floating car sharing (Appendix 2).

Station-based car sharing providers offer vehicles at fixed base stations. This model is usually used for round trips where the pick-up and drop-off locations coincide. Reservations can be made in advance, offering customers higher reliability (Vaskelainen & Münzel, 2018). Stationary car sharing is suitable for users who do not attach great importance to vehicle ownership but appreciate reliable access to a car when needed. The fleet is usually characterized by a large selection of models, offering individual solutions and good driving experience. This approach is mostly present in small to medium-sized cities and rural regions (Deloitte, 2017). The utilization of station-based car sharing is planned in detail. Success is usually dependent on local market knowledge and partnerships. From a customer's perspective, station-based car sharing is more cost-effective, offering one-hour rides in a small or medium-sized vehicle for 2 to 6 euros (Flinkster, 2019).

Free-floating car sharing, on the other hand, is more flexible due to its freely selectable pickup and return locations within a pre-defined area. It is offered in big cities, providing small and medium-sized vehicles for mostly short one-way trips. Users locate a car parked nearby on an

as-needed basis and book the vehicle through a mobile application. This approach is well suited for spontaneous trips, offering high flexibility while entailing a comparatively higher risk of unavailability (Deloitte, 2017). Reservations in advance are not possible apart from free overnight reservations offered by some providers (ShareNow, 2019). While station-based providers are usually local, free-floating services are often owned by car manufacturers (such as Daimler or BMW). Car manufacturers are mainly offering car sharing to promote new models and obtain customer insights. Prices are higher than station-based car sharing, usually ranging at 17 to 20 euros for a one-hour ride in a small vehicle (Bundesverband CarSharing, 2019).

Recently, combined car sharing has appeared in some markets, entailing the offering of station-based and free-floating vehicles from one source. The combination of both variants has the advantage that customers can reserve vehicles in advance as well as book them spontaneously.

3.2 | Top players in the car sharing market

In May 2019, car sharing services were offered in more than 3100 cities worldwide (Movmi, 2019). Most of the cities have only one operator, which in most cases, is a station-based provider. The two biggest station-based car sharing providers are *Zipcar* and *Flinkster*, whereas the top free-floating player is *SHARE NOW* (see Appendix 3).

Zipcar is the biggest stationary car sharing provider operating in 384 cities in 2019, mostly in the United States and Canada. It operates around 16 000 vehicles and serves more than 1 million members (Movmi, 2019). *Flinkster* is operated by the German railway company *Deutsche Bahn AG*. It focuses on the German market, with more than 800 stations in 140 cities offering a broad range of models, including electric vehicles. It has a high number of regional partners and collaborates with local car dealerships (Deutsche Bahn, 2019). The biggest player in the free-floating car sharing market is *SHARE NOW*, which – as of November 2019 – is a joint venture between *Daimler's* car sharing service *car2go* and *BMW's* car sharing firm *DriveNow*. *SHARE NOW* has more than 4 million members worldwide, from which 3 million are in Europe and 1 million in North America. It operates in 21 European and 6 North American cities. Currently, the

firm provides approximately 20 000 *BMW*, *Mercedes-Benz*, *MINI*, and *Smart* vehicles. Out of all vehicles, 3 200 are electric cars (SHARE NOW, 2019a).

3.3 | The German car sharing market

In the last years, car sharing in Germany – the biggest car sharing market in Europe – has experienced strong customer growth. In total, there are around 170 car sharing providers, with approximately 2.46 million registered customers in 2019 (Bundesverband Carsharing, 2019). At the beginning of 2019, 740 cities were providing station-based car sharing, and 18 bigger cities had free-floating providers (Statista, 2019c). It is to be noted that even though the free-floating model is only available in 18 cities, more customers use free-floating services: 1 810 000 consumers using free-floating vs. 650 000 who use station-based services (Statista, 2019d; see also Appendix 4). Crucially, this shows that even though car sharing is more popular in urban areas, there is potential in rural areas since this market is far from being exploited yet. In the German market, the biggest car sharing provider is *SHARE NOW*, offering free-floating car sharing in seven cities. Currently, *SHARE NOW* provides 7 200 vehicles, out of which 1 230 cars are electric (SHARE NOW, 2019a; see also Appendix 5). The second-biggest car sharing firm is *Flinkster*, offering 4 500 station-based vehicles to 315 000 customers. Besides these two main players, there are various smaller providers. Appendix 6 presents an overview of the providers in Germany (Statista, 2019e).

3.4 | Electric vehicles in car sharing

Climate change and new regulations are forcing automotive businesses to alter their business models to become more environmentally friendly (Witzke, 2016). In this context, the crucial initiative was the development of electric vehicles (EV).⁴ An EV is a vehicle that uses electric motors for propulsion (Business Standard, 2019). The success of EVs is mainly driven by financial support and legal regulations (such as CO₂ emission limits). Since EV drivers are still neglected in

⁴ One of the main drivers of the production of EVs is regulations. The European Union requires that new vehicles should emit no more than 95g of CO₂ per km after 2021 and 60g of CO₂ per km from 2030 onwards. This can only be fulfilled if a larger proportion of new cars in Europe is electric (Mattes, 2019).

many countries, EVs are not as successful as desired by authorities and, contrary to expectations, sales figures are still relatively low. Potential customers are discouraged by high purchase prices and the undersupply of charging stations. The latter issue, coupled with the limited range of EVs, is a significant deterrent of customer demand.⁵ Integrating EVs into the fleet of car sharing services could help to increase the vehicles' appeal by allowing users to test an EV at a low cost. In recent years, many providers have integrated EVs in their car sharing fleet, and some of them even offer purely electric car sharing services (Rid et al., 2018). Nevertheless, obstacles such as the range issue must be tackled, and the charging infrastructure's density must be boosted. Comparing the percentage of EVs in car sharing fleets with the proportion in the nationwide private car fleet, the former is severely higher. In 2018, 1 700 of 17 950 car sharing vehicles were electric (9.5%), whereas only 0.1% of privately owned cars were electric (Edison, 2018). In free-floating car sharing, this proportion is above average.

4 | Car dealership market

The automotive industry is experiencing a transformation, which is pressured by new requirements and climate protection goals (Mattes, 2019). The development affects not only car manufacturers but also car dealerships. A car dealer – also referred to as an automotive dealer – is a business that sells vehicles produced by an automotive manufacturer in a particular area (Cambridge, 2019). Their business is usually structured in vehicle sales of new cars, vehicle sales of used cars, car accessories sales, and vehicle repair services. Car dealerships are mainly operated as authorized dealers of vehicle manufacturers. Most of them are brand-exclusive dealers that have a partnership with a single car manufacturer, thus selling their vehicles in exclusivity (Fassnach et al., 2011). However, due to the increased concentration that has taken place in recent years, more car dealers are merging into dealership groups or are selling several vehicle brands instead of only one, thus becoming multiple-brand dealers. Within the automotive industry, car dealerships could become the primary victims of technical developments and new trends. Their business model is currently in

⁵ EVs have a limited range compared to the range of internal combustion engine-powered vehicles.

disarray (Handelsblatt, 2018). Initially, a local car dealer offered advice, test drives, personalized discounts, and handed over the key to a new car. Now, customers expect much more than that, inducing traditional car dealers to become mobility providers offering a broad portfolio of vehicles and services.

The success of automotive dealerships strongly depends on the number of vehicles sold and on aftersales services. A study shows that the profit of car dealers could go down by almost half by 2035 (Autohaus, 2019). To stay competitive, car dealers must proactively adapt to new trends and challenges and recognize them as an opportunity rather than an inevitable threat.

4.1 | Trends in the automotive car dealership market

Four main trends are currently influencing automotive dealers: digitalization, new go-to-market strategies, changing customers' preferences, and EVs.

Digitalization leads to new distribution mechanisms in the new and used vehicle market. Online sales of vehicles have increased. Nowadays, 34% of customers would buy their car solely through e-commerce, configuring the car online based on individual preferences (Gaul & Wagner, 2017). The Internet, considered as the most important source of information in the vehicle purchase process, leads to high price transparency and a broad selection of available models. Furthermore, the Internet changes the go-to-market strategies of car manufacturers. Traditionally, there was a clear separation between vehicle production and vehicle sales. While car manufacturers were specialized in the production, car dealers were responsible for the distribution of vehicles and represented car manufacturers towards customers. However, currently, car manufacturers sell a high percentage of vehicles directly through the online distribution channel, which leads to direct competition between manufacturers and dealers (McKinsey, 2014). Case studies such as Tesla have proven that, nowadays, market development is possible without an extensive dealership network. Another trend is changing customers' preferences (Gaul & Wagner, 2017). Younger persons still consider cars as an essential good, but they are more open-minded regarding alternative modes of transportation and ownership. Urbanization and a broad mobility offer in big cities are fueling this

trend. Mobility-as-a-Service (MaaS) offerings gain importance and will likely reduce car purchases.⁶ The last major trend is the increasing number of EVs. It is encouraged by political requirements regarding CO₂ emissions reduction (Dudenhöffer, 2019). However, EVs are not only more costly to produce (and thus more expensive), but also require large investments in employee training. Both of these aspects are detrimental to car dealers. Furthermore, they require less need for repair services. Car dealers make around 35 percent fewer parts sales from EVs in the aftersales business segment and forgo highly profitable service hours (Handelsblatt, 2018).

4.2 | SWOT analysis of car dealerships

Identifying strengths and weaknesses (internal factors), as well as opportunities and threats (external factors) of car dealers, will help to analyze their position in the context of a fast-evolving mobility market.

Strengths Car dealers are very experienced in offering an all-round service from a single source. They play an important role in a vehicle's purchase decision-making process since vehicles are complex products that require detailed information (Statista, 2019f). Another strength is their close customer proximity and strong client relationship. In terms of new mobility services, their most significant advantage is that they already have the required resources and knowhow in house. They receive discounts when purchasing new vehicles and own a broad range of rental cars, exhibition vehicles, and test-drive vehicles. Furthermore, cleaning and repair services can be fulfilled by the existing personnel. Finally, they already have a comprehensive network and a well-developed infrastructure in terms of software, accounting, and other administrative work.

Weaknesses Although most customers prefer to purchase vehicles directly at a car dealer, already 30% would buy their new car solely through e-commerce. The traditional purchase of vehicles at car dealerships is costly and is not compatible with current developments (Dudenhöffer, 2019).⁷

⁶ MaaS is an approach to replace own-vehicle transportation with a range of mobility services tailored to customer needs (MaaS Alliance, 2018).

⁷ Notably, there is a similarity between the threat to travel agencies faced with novel competitors that exploit the cost-reducing advantage of the online channel, and the current challenges faced by car dealers (Stevic, 2012).

Another weakness is that repair services – an essential source of revenue – will decrease. Since car dealers have significant capital tied up (e.g., buildings), it is not easy for them to free sufficient liquidity for new mobility projects. Finally, car dealers must move from professionals in mechanics to professionals in new fields such as software-management and connectivity.

Opportunities Due to the growing importance of sustainability, EVs will become an important product in car dealers' range of vehicles. Furthermore, digitalization offers car dealers the possibility of strengthening their core business (through process optimizations) and brand by becoming less dependent on their respective manufacturers. Car dealers can use the Internet and mobile applications to maintain a close relationship with customers and to offer constant accessibility. Webpages can also be used as a source of information and as a sales channel to fulfill individual customer requirements (Statista, 2019f). Moreover, car dealers can find new growth factors within the value chain. Due to a growing demand for shared mobility, car dealers have the opportunity to integrate car sharing into their business model (Gaul & Wagner, 2017).

Threats Car dealers are threatened by a high vehicle saturation in European markets. Due to the increasing importance of MaaS, they face the risk of steeply declining car sales. Furthermore, industry transparency and a large offer of vehicles through online channels result in high competition and price pressure (Statista, 2019f). The direct go-to-market strategy of car manufacturers affects the successful model of long-term collaboration on which their relationship is based. Since car dealers are very dependent on the relationship with car manufacturers, this threatens their business. Climate change and new regulations are both an opportunity and a threat to car dealers. On the one hand, they may sell fewer vehicles than they traditionally did. On the other, they may become providers of MaaS services. If they do not react to changes and focus on more environmentally friendly business models, they run the risk of being locked out of the market. Overall, putting together the current market of car dealers with the increasing importance of shared mobility, we can say that there may be a potential for car dealers to integrate shared mobility services in their business model.

4.3 | Analysis of the German car dealer market

The automotive industry is the largest industry in Germany and generated more than 426 billion euros of revenue in 2018 (Statista, 2019g). This makes apparent the industry's relevance. Within this industry, car dealers play an important role in the distribution of new and used vehicles. In a European car dealership comparison, German car dealers generate the largest revenue, amounting to 274 billion euros in 2017 (Statista, 2019f). The traditional business model whereby customers buy new vehicles from a local car dealer is still the most common way of purchasing a car in Germany. However, most major car manufacturers will reduce their car dealership network in the future (Autohaus, 2017). Furthermore, the need for large investments in new mobility services and the online channel renders the survival of small and medium automotive firms questionable.

5 | Consumers' survey

To analyze the potential of car sharing and the attractiveness of the service, a survey of potential users was conducted. Before the survey was launched, it was pre-tested on six individuals. The distribution proceeded through various social media channels, such as LinkedIn and Facebook. In total, 301 participants completed the survey. Of these, 283 participants, those holding a driver's license, were retained. The 18 participants who do not hold a driver's license were not considered. Including them could put the validity of results into question since only 16% of the questions applied to them and thus could be answered. Regarding country coverage, the 283 considered participants are residents of 25 countries. However, most are from Germany (43%), the USA (17%) and Portugal (15%). When distributing the survey, Germans were the main target group since Germany is the biggest car sharing market in Europe, and the interviews were conducted with German experts. To allow for international comparisons, the results of participants residing in Germany were compared to the USA and Portugal. Considering age, 67% of participants are between 22 and 30 years of age, and 22% are between 31 and 40 years of age.⁸ This uneven age

⁸ Participants had to choose between different age ranges. The options go from "less than 18 years old" up to "more than 50 years old". The survey includes participants of all age ranges.

distribution could negatively influence the statistical representativeness of the sample since it is biased by the overwhelming presence of young respondents. However, since young respondents by definition will be operating in the market for longer, the aforementioned bias may be less of an issue, or perhaps even an advantage. To capture differences between urban and rural areas – a crucial aspect in view of our research questions – comparisons between big and small cities were made. 54% of respondents reside in a big city (defined as having more than 500 000 inhabitants), and 27% reside in a small city (defined as having less than 100 000 inhabitants).

5.1 | Importance of car ownership

Of all respondents, 61% own a car, 19% do not own a car, but share one with family or friends, and 20% do not own a car.⁹ The comparably small proportion of persons who do not own a car leads us to the first important conclusion: car sharing providers must target car owners as well. This demands the implementation of an appealing concept, which, for instance, could highlight the advantages of car sharing for particular purposes.

Overall, 66% of respondents find car ownership important, with the level of importance varying significantly between countries. In Germany, this percentage is smaller (58%) than in Portugal (79%) and the USA (88%), which are above average when considering the whole sample. 63% of car owners indicate that their car is parked more than 90% of the time, and 8% of them drive less than once a week. This leads to another crucial insight: both results support the potential of car sharing. Finally, looking at the role of car dealerships, 60% of car owners stated that they have visited a car dealer, while 40% have never visited one. This leads to two relevant conclusions: it highlights the important role played by car dealers but also shows that a high percentage of consumers use other channels to purchase a car.

⁹ American respondents may bias upwards the ownership distribution since the percentage of car owners in the USA is very high, amounting to 92%.

5.2 | Car sharing services registrations

Regarding the number of car sharing registrations, we first examined how well-acquainted respondents are with car sharing. Overall, 67% of respondents stated that they are not well informed about car sharing. Especially in smaller cities, there is a marked lack of knowledge, with 82% of respondents being fairly or totally unfamiliar with the topic (27% stated that they are not well informed *at all*). From an international perspective, respondents residing in Germany are much better informed than the ones residing in the USA or Portugal.

The survey suggests that there is a positive relationship between information level and car sharing registration. While 67% of well-informed respondents are registered with a car sharing service, only 3% of badly informed participants are registered. Since users are more willing to try well-understood services than unknown (or obscure) ones, this brings us to our next insight: more information through advertising leads to concept awareness and clarification and should enlarge the market for car sharing. From the viewpoint of our research questions, the survey results make it clear that car dealers will face the challenge of explaining the car sharing concept to customers.

In total, 30% of respondents are registered with a car sharing provider, while 70% are not. In Germany, car sharing is more prevalent than in other countries.¹⁰ Since most providers offer free or inexpensive registration, the cost is normally not the reason for not being registered.¹¹ Respondents stated various reasons for not being registered, which differ between big and small cities.

TABLE 1: Reasons indicated by respondents for not being registered with a car sharing provider.

	Reasons for not being registered in big cities (> 500 000 inhabitants)	Reasons for not being registered in small cities (< 100 000 inhabitants)
1	I value the flexibility of car ownership	No car sharing provider operates in my area
2	Lack of availability/Risk of not finding a car nearby	I value the flexibility of car ownership
3	I do not want to share a car	I do not want to share a car

Source: user's survey

¹⁰ 41% of respondents residing in Germany are registered with a car sharing provider, and 11% stated that they use car sharing services regularly. Car sharing is much more popular in big German cities, where 63% are registered. In contrast, only 16% of the respondents who reside in small German cities are registered with a car sharing provider.

¹¹ *SHARE NOW* offers free registration, while *Flinkster* charges a one-time registration fee of up to 9 euros.

Overall, the most stated reason was the flexibility offered by car ownership. In small cities, the main reason for not being registered is that there is no car sharing provider in the area. This brings up another valuable insight: there is potential for car dealers to implement car sharing in small cities. Another reason given by respondents for not registering is that they do not want to share a car. This suggests that it will be challenging to convince some users to try or use car sharing. The risk of not finding a car nearby brought up by respondents raises two issues: availability rate and maximum tolerable walking distance (see discussion below). Other reasons stated were preference for public transportation, the lack of knowledge regarding the use of car sharing, long travel distances, and the use of ride hailing services (e.g., Uber) instead of car sharing. Finally, 78% of survey participants indicate that they think that car sharing will play an important role in the next ten years. This bodes well for the prospects of car sharing.

5.3 | Own car vs. car sharing

Privately owned cars and car sharing vehicles serve different purposes, though both are used for leisure travel. Own vehicles are often used for shopping or to travel to work. In contrast, besides leisure travel, car sharing is used for rides to and from the airport and during business trips when an own car is not available. Besides, it is used to get to a party or when a bigger vehicle is needed to fit specific items. These results highlight that car sharing is usually not a *substitute* for car ownership but rather a *complement* serving other purposes. This lends further support to the insight obtained in Section 5.1 that car sharing providers must target car owners as well.

5.4 | Car sharing's success factors

Pricing is a crucial success factor for car sharing. 81% of respondents are willing to pay up to 2.99 euros for a 5 km car sharing ride, and 76% indicate that car sharing only attracts customers if it is inexpensive. 33% of car owners would consider using their own car less often if there was a well-developed car sharing network, provided that it is less expensive than using their own car. However, a significant percentage of car owners (29%) state that they would *not* consider car sharing even if

the network is well-developed and less expensive than using their own car. This group will be hard (or impossible) to induce to switch to car sharing.

The walking distance to the pickup location of a car sharing vehicle is a further success factor. The majority is willing to walk up to 299 meters (33%) or 499 meters (31%). 25% of car owners indicate that they would consider not buying a car if there is a well-developed car sharing network in their city. This presents a high potential of car sharing, insofar as it is well developed. Considering the distance traveled, 70% find car sharing appropriate for short distances, while only 46% find it suitable for long distances. A high utilization rate is crucial for the success of car sharing. Since most respondents would use car sharing sporadically, calculating the optimal fleet size is challenging for providers: if it is too small, the availability and maximum tolerable walking distance will become issues; if it is too big, costly idle vehicles will hurt profitability. Offering car sharing with the option that customers may reserve vehicles in advance simplifies fleet size planning. It also may increase the attractiveness of car sharing since 66% of participants are more likely to use car sharing if they have the option to reserve vehicles for specific times and places. This brings up another conclusion: when implementing car sharing, car dealers should allow advance booking.

5.5 | Public transportation vs. car sharing

Public transportation influences the potential of car sharing. 64% of respondents state that their home is well served by public transportation, while 25% indicate that it is badly served. However, 42% of small cities' respondents state that they are badly served. On the one hand, this complicates the implementation of (station-based) car sharing since it is harder to reach a pickup station. On the other hand, it may open a market for car sharing to improve connectivity. The quality of public transportation in big cities may be deemed good overall but is highly dependent on the country. In terms of usage, a large percentage of participants do not use public transportation (28%) or use it less than once a week (22%), while 8% use it 5–6 times a week, and 20% use it daily. In an international comparison, the use of public transportation in Germany is more than three times higher than in the USA. The reason for such a difference between the two countries may be the

often insufficient public transportation system in many American cities. The quality of public transportation may influence the number of car sharing registrations. While 36% of respondents residing in a city with good public transportation are registered with a car sharing provider, only 20% of participants residing in a city with bad public transportation are registered. Furthermore, 53% of respondents state that they would be interested in a new mobility network combining public transportation with car sharing services. Interestingly, the quality of public transport and the number of car sharing registrations seem to display a positive correlation, which means that public transportation and car sharing services are complements rather than substitutes.¹²

In Germany, the quality and use of public transportation varies highly between big and small cities. In big German cities, only 2% of respondents do not use public transportation, while 54 % use it more than 5 times a week. Conversely, in small cities 44% of respondents do not use it at all and 7% of respondents use public transportation more than 5 times a week.

5.6 | Car sharing and electric vehicles

79% of participants who have not driven an EV yet state that they would be interested in driving one. This brings up another insight: car sharing may be a very appropriate way to test these vehicles. Furthermore, 39% of respondents indicate that they are more likely to consider car sharing if the provider offers a large number of EVs. Consequently, car sharing providers that include EVs in their fleet are more attractive, another critical insight relating to our research questions.

5.7 | Car sharing in rural areas

A high percentage of respondents (69%) state that car sharing can expand in rural areas if it is well developed and offers high levels of availability and proximity. The two main reasons why participants believe that car sharing is often not offered in less populated areas are long walking distances to the pickup locations and lower flexibility of car sharing compared to an own car.

¹² One may rationalize this finding by envisioning a mixed journey combining public transportation (e.g., a train ride from the residential area to town) with car sharing (e.g., a “last mile” journey from the train station to the office).

6 | Expert interviews

To get a better understanding of the supply side, five semi-structured expert interviews were conducted. The experts are from different segments in the automotive industry: One car manufacturer (EXPERT 1), one shared mobility provider (EXPERT 2), and three car dealers offering car sharing services (EXPERT 3, 4 and 5). Two car dealers are offering B2C car sharing in cooperation with Ford. The third car dealer developed an independent B2B car sharing model using its own IT and platform. The interviews were conducted via phone. Four of them lasted between 45 and 60 minutes, while one lasted 20 minutes. A description of the business models of the five firms, can be found in Appendix 9.

6.1 | Influence of shared mobility on traditional business models

The interviewees indicated that shared mobility has a disrupting impact on the automotive industry. According to EXPERT 1, “in conjunction with shared mobility, the hardware (vehicle) is not the priority brand anymore, instead the brand of the shared mobility provider is the priority.” Furthermore, the characteristics of shared vehicles differ from privately purchased cars since they have to be easily adaptable (e.g., adjustable seats) and cover various intended purposes (e.g., trailer hitch) (EXPERT 3). All experts state that it is very important for car manufacturers and car dealers to deal with shared mobility in order to be successful in the future. According to EXPERT 4, “car dealers should see shared mobility as a chance, also in smaller economic regions”. He indicates that car dealers should view car sharing as a complement to their current business model. EXPERT 3 believes that “car dealers have to become mobility providers that are open towards new technology”. The experts think that new vehicle sales in Germany will decrease in the future. Therefore, reacting proactively to new trends is crucial to stay competitive or even to survive.

6.2 | Car sharing’s profitability

All interviewees stated that it is not easy to attain profitable when offering car sharing. According to EXPERT 1, the free-floating model can be successful in some big cities but is unprofitable in most others. He indicates that “in high population density areas, which have a reasonable traffic situation,

there are a lot of customers”. EXPERT 3, providing B2C car sharing, stated that it took them six years to reach profitability. However, the experts express that even if car sharing may not be that profitable by itself (especially in the early stages of its implementation), it has a positive effect on the value chain of car dealers due to maintenance and repair services that lead to additional revenue.

6.3 | The reasons for car sharing

According to all interviewees, profit is not the key reason for investing in car sharing. It is mainly used for learning purposes. EXPERT 1 believes that “municipalities will increasingly restrict individual car ownership”. According to EXPERT 3, “topics such as e-mobility and car sharing gain in importance and, therefore, car dealers should try out alternative mobility concepts.” In line with the results of the consumer survey, the experts think that car sharing will play an important role in the next ten years. They believe that the breakthrough of car sharing will come with autonomous vehicles, though this development lies far ahead. Starting to deal with car sharing today helps in gaining experience, which becomes an advantage in the future. Furthermore, the experts state that it is a good marketing tool and improves the image of a car dealership. Linking this point to the survey results, one concludes that car sharing should help to increase the number of customers since 40% of car owners have never visited a car dealership. EXPERT 4 voices that “car sharing allows car dealers to collect data of customers, which helps to analyze driving behavior and to create individualized marketing”. It also yields additional revenue when it constitutes a paid test drive. Finally, car dealers have the advantage of already having the resources and infrastructure necessary for car sharing. According to the three car dealers, the vehicles for car sharing can be procured at the same purchase price as other vehicles. After their use in the car sharing fleet (between 12 and 24 months), the cars can be sold as used vehicles. This mechanism significantly lowers the risk of implementing car sharing.

6.4 | Car sharing: customer segmentation

According to the experts, there is no typical customer segment. In line with the results of the consumer survey, EXPERT 2 states that car sharing mostly attracts “modern customers who are

between 20 and 40 years old”. The responses regarding purposes and travel distances of car sharing agree with the results of the survey. Car sharing is mostly used for short distances and is often combined with public transportation. Only the car sharing model of one expert differs from this paradigm since its fleet also contains vans, which are used for longer distances (EXPERT 3). The reasons stated by the interviewees why people do not use car sharing are fully consistent with the results of the survey: long walking distances, time-consuming registration process, and lack of knowledge.

6.5 | Car sharing’s success factors

The experts state that success factors differ between free-floating and station-based car sharing. They believe that free-floating car sharing is highly dependent on the size and density of a city, while station-based car sharing is based on other factors and thus may be implemented in cities of any size. Due to the high market penetration of free-floating models in big cities, car dealers should focus on cities where competition is low. All experts suggest that a station-based model is the appropriate car sharing model for car dealers.

In full accordance with the results of the survey, the experts indicate that pricing has a strong influence on the success of car sharing. If it is nearly as expensive as taxi rides, customers may prefer to take a taxi. EXPERT 3 states that his car dealership “offers car sharing cheaper than the usual Ford car sharing price to attract customers”. The interviewees are certain that the walking distance to the pickup location is a crucial success factor. In full alignment with the results of the consumer survey, the experts state that a distance of up to 500m is acceptable. Therefore, a central and easily accessible location for the base station is crucial.

Finally, according to EXPERT 3, “the more expensive the maintenance of an own car and the harder it is to find parking, the more attractive car sharing gets”.¹³ Furthermore, IT, vehicle linkage and a

¹³ New regulatory measures that hinder the use (and parking) of own cars have been put in place recently (Business Insider, 2018). It is suggested that a steepening of this kind of regulatory disincentive to own car use is needed to relieve city centres of excess traffic and to avoid excessive emissions. This trend accentuates the comparative advantage of car sharing.

sufficient vehicle fleet are important success factors. Overall, the major driver that determines the success of car sharing is utilization (EXPERT 1).

6.6 | Public transportation vs. car sharing

Public transport influences the success of car sharing. According to EXPERT 5, “a good public transportation system increases the success of car sharing since the two services can complement each other”. This statement is supported by the results of the consumer survey, as well as the remaining experts’ opinions, who think that public transportation users are more likely to share a car. However, EXPERT 3 argues that “bad public transportation in rural areas may be used as an opportunity since some municipalities prefer moderate investments in car sharing than more costly investments in a public transportation system”.

6.7 | Car sharing and electric vehicles

According to EXPERT 4, the “mega trend is not only sharing but sharing electric”. The experts indicate that electric car sharing has a higher acceptance among municipalities since it helps them to lower pollution. Furthermore, it is more attractive to users due to the public’s interest in testing EVs. However, EXPERT 3 states that in his case, “compared to other vehicles in the car sharing fleet, EVs are the ones with the worst capacity”. The reasons underlying this viewpoint are that customers are less familiar with EVs than with internal combustion engine vehicles and, as a result, do not know how to operate them. This is an entry barrier. Overall – in full agreement with the survey results – EVs may increase the attractiveness of car sharing. However, a crucial aspect when integrating EVs into car sharing fleets is to give customers sufficient information on how to operate them in order to overcome this entry barrier. Finally, an improvement of the charging infrastructure is important, which can only happen if governments support this development (EXPERT 4).

6.8 | Car sharing in rural areas

Implementing car sharing in bigger cities may be difficult since a few big players already dominate these markets. Due to the lack of car sharing in low population density areas, competition is low. Four of the five experts state that there is potential for car dealers to offer car sharing in low

population density areas. The fifth expert thinks that the implementation of car sharing in rural areas is difficult.¹⁴ The results of the interviews accord with the user's survey (69% of respondents think that car sharing can expand in rural areas if it is well developed).

The experts state that in rural areas, only station-based car sharing works. They indicate that rural car sharing should offer the option to book vehicles in advance. According to EXPERT 1, "car sharing is usually only possible for car dealers as a franchise partner of an umbrella brand which provides the IT". However, the business model of EXPERT 4, based on its own IT, shows that there might be cases where it is even possible to succeed independently. The experts believe that many municipalities support car sharing to increase their "green image" and to counteract underdeveloped public transportation systems. This advantages car dealers in their efforts to offer car sharing.

6.9 | The German car sharing market vs. other countries

According to the experts, Germany is more suitable for car sharing than the USA or Portugal. In Portugal, owning a car is an important status symbol and individual mobility is more important than in Germany. In the USA, own vehicles play an important role since travel distances are long, public transportation is often badly developed and cities are designed for car use, which simplifies finding a parking space. One expert believes that in the USA, ride hailing is way more important than car sharing (EXPERT 1). Again, these statements are fully consistent with the results of the survey.

7 | Conclusion

We analyzed the attractiveness of car sharing and the potential for car dealers to integrate car sharing into their business model. Our comprehensive analysis leads us to answer both research questions in the positive, though with several provisos.

How attractive is car sharing for potential customers? The analysis has shown that car sharing is attractive to customers. Over the last years, there has been an increase in shared mobility services, and the car sharing market has grown significantly. As demonstrated by the user's survey and expert

¹⁴ For a case study of an unsuccessful introduction of car sharing in a rural area see Appendix 10.

interviews, there is a demand for car sharing, especially among the younger generation. The demand is highly dependent on the country, with the German market's demand being above average. In contrast, the demand in the USA is low, which can be explained by the high importance of car ownership and the preference of ride hailing services. After the analysis in this paper was concluded, Daimler and BMW have announced that *SHARE NOW* will exit the North American market due to “extreme difficult realities” (Manager Magazin, 2019; Shepardson, 2019). Interestingly enough, this is consistent with the survey results. On the one hand, the results of the survey are a possible explanation of this decision; on the other hand, the decision validates the quality of the survey's data.

Is there potential for car dealers to integrate car sharing into their business model? As yet, most small cities do not provide car sharing services, opening a market for car dealers. Car dealers should tackle car sharing since shared mobility gains in importance. Becoming a mobility provider will be crucial for the success of car dealers. Therefore, they should gain experience in car sharing. Even though car sharing on, average, may not be immediately profitable, other aspects support the integration of car sharing. It may be used for learning purposes. Furthermore, it is a good marketing tool and may increase the image of the dealership. Another advantage is that car dealers can use their existing resources and sell car sharing vehicles in the used vehicle market after usage. Due to maintenance services, car sharing will have a positive effect on their value chain. All of this leads us to the conclusion that the integration of car sharing may have a positive effect on car dealers' business model and may even be a crucial success factor in the future.

The outcomes of the analysis lead us to several *recommendations*: (i) Car dealers operating in areas where no large car sharing provider is present should consider whether to offer station-based car sharing. Doing so helps them to differentiate themselves and to stay competitive. (ii) When deciding whether to offer car sharing, car dealers should gauge users' demand in their operational region since demand varies widely across countries and regions. For instance, while the demand for car sharing is quite high in Germany, it is fairly low in the USA. (iii) When implementing car sharing,

partnerships are critical. Car dealers should use the IT of an umbrella brand or a third party. Moreover, agreements with municipalities regarding parking and funding are also essential.

(iv) Dealerships should use existing resources and negotiate favorable vehicle purchase prices with car manufacturers. After 12 to 24 months, car sharing vehicles should be sold in the used vehicle market. (v) The target group should comprise non-car owners as well as car owners. Due to the relatively higher demand among younger generations, car dealers should mainly target persons aged 18 to 40. (vi) Proper marketing of car sharing services is essential. Car dealers must thoroughly explain the service to customers since a higher level of information leads to more acceptance. (vii) Pricing is a crucial success factor and profoundly impacts the attractiveness of car sharing. Car dealers should use the pricing model of an umbrella brand or offer it at a more competitive price to increase awareness. (viii) The walking distance of most potential clients to the pickup location of the vehicle should not exceed 500 meters. (ix) The base location should ideally be easily accessible by public transportation. (x) Advance booking should be offered since it increases the service's attractiveness and thus the utilization rate of each vehicle. (xi) Finally, the integration of EVs in a car sharing fleet could increase the attractiveness and acceptance of car sharing.

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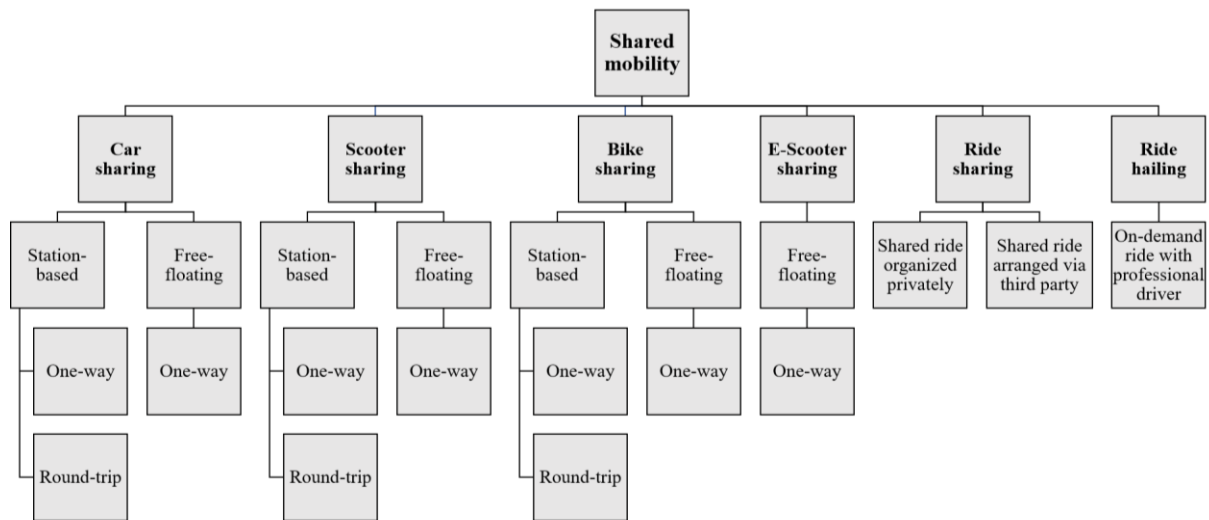
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9 | Appendices

Appendix 1: Shared mobility models



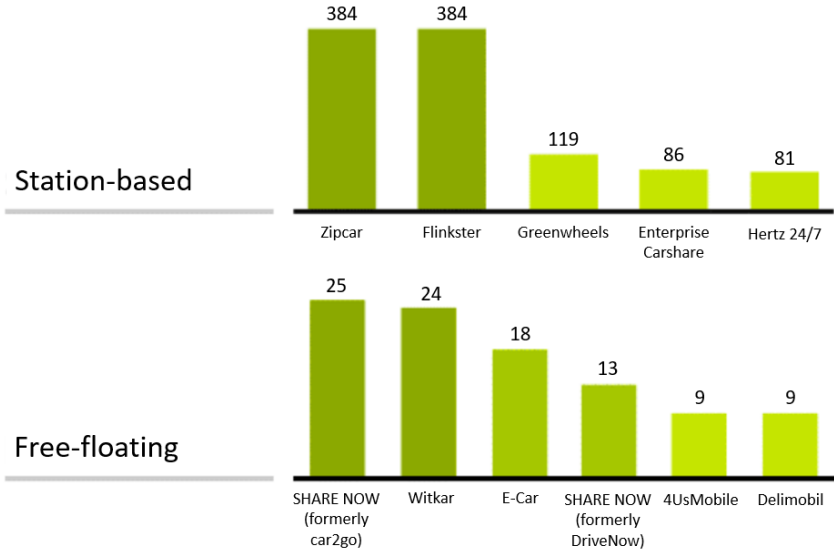
Source: author's own graph

Appendix 2: Station-based vs. free-floating car sharing

Characteristics	Station-based car sharing	Free-floating car sharing
Trip type	Round trips: Pick-up and drop-off locations coincide.	One-way trips: Freely selectable pick-up and return locations within a pre-defined area.
Booking	Advance booking possible.	Advance booking not possible (besides overnight reservations).
Fleet	Large variety in the vehicle fleet, including vans.	Focus on small and medium-sized vehicles.
Characteristics	Less flexible, lower risk.	More flexible, higher risk.
Cities	Mostly present in small to medium-sized cities.	Only present in large cities with high density (allowing free-floating model).
Prices	More cost-effective from a customer's point of view.	More expensive from a customer's point of view.
Providers	Usually organized on a local level.	Mostly offered by global OEMs.

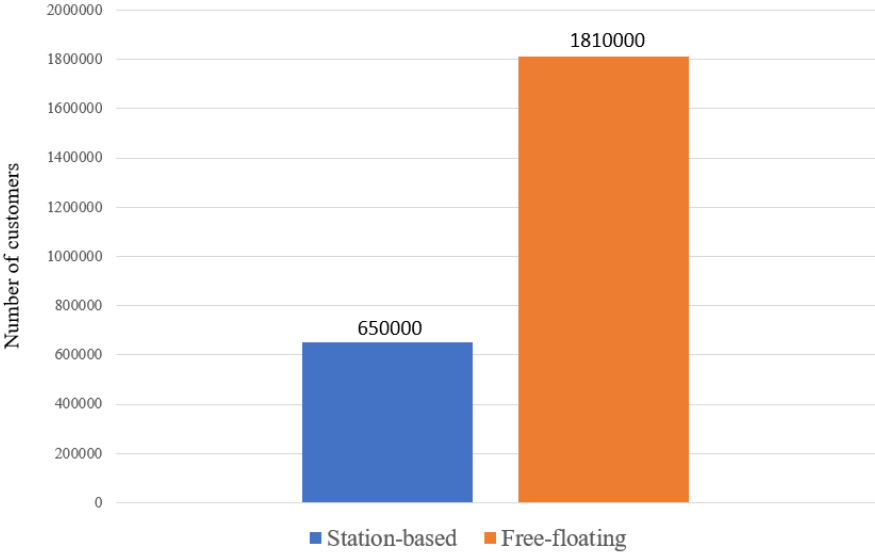
Source: author's depiction based on Deloitte (2017) and Vaskelainen & Münzel (2018)

Appendix 3: Biggest station-based and free-floating car sharing providers based on the number of cities where they operate (as of July 2019).



Source: Movmi, 2019

Appendix 4: Number of people entitled to drive car sharing vehicles in Germany (as of January 1, 2019)



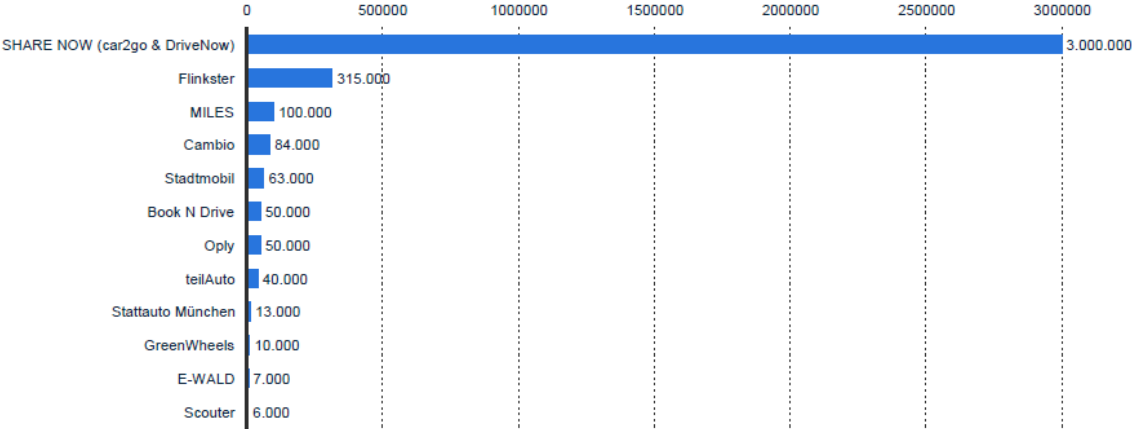
Source: Statista (2019d)

Appendix 5: Fleet size and electric fleet size of SHARE NOW in Germany (as of November 2019)

COUNTRY	LOCATION	LAUNCH	FLEET	ELECTRIC
Germany	Berlin ☐	09 / 2011	2500	120
	Frankfurt	09 / 2014	300	-
	Hamburg ☐	04 / 2011	1500	400
	Munich ☐	06 / 2011	1200	200
	Rhineland (Duesseldorf & Cologne) ☐	01 / 2012	1200	10
	Stuttgart 🇩🇪	11 / 2012	500	500

Source: SHARE NOW (2019a)

Appendix 6: Biggest car sharing providers in Germany based on number of customers (as of October 2019)



Source: Statista (2019e)

Interview Guide

“The potential of car sharing for automotive dealers”

Date: December xx, 2019 xx:xx p.m.

Warm-up

“Thank you for taking the time to talk to me today. I am conducting research on car sharing with a special focus on the potential for car dealerships to start offering car sharing as part of their business model. In the following interview, there are no right or wrong answers and everything we talk about today is *strictly confidential*. Do you mind if I record this interview? We are going to cover different topics related to car sharing in the next 30–45 minutes. If you have any questions, please do not hesitate to ask them at any time.”

Background information

- Could you briefly introduce yourself and describe your position at xxx [*insert company name*]?
- For how many years has xxx [*insert company name*] been dealing with car sharing?
- Could you please describe the car sharing business model that xxx [*insert company name*] is offering?
- In how many locations does xxx [*insert company name*] operate car sharing?

Questions related to car sharing

- How successful in terms of profitability and number of customers would you rate the current car sharing market?
- How high is the intensity of competition in the car sharing market?
- For what purpose or purposes do people mostly use car sharing?
- What is the average travel distance customers cover when using the service?
- Which customer segment or segments use car sharing? Please characterize them from the following viewpoint: demographic, geographic, lifestyle.
- What are the reasons that lead some people to prefer not to use car sharing? Please address all those that you find relevant.
- How does pricing influence the success of a car sharing service?
- How does the walking distance to the pickup location influence the success of a car sharing service?
- Which characteristics should a city have in order to be suitable for car sharing? Please differentiate between the free-floating and the station-based models.
- Do you think car sharing is more attractive when the vehicles are electric?
- [Question only to new mobility provider] How successful would you rate the electric-vehicle car sharing market?

Questions related to car dealers and OEMs

- What are the current challenges faced by car dealers?
- What are the current new opportunities opening up to car dealers, if any?
- Will vehicle sales decrease or increase in the future?
- [optional; by reference to previous answer] Since you believe that fewer vehicles will be sold, is car sharing one of the reasons for this development?
- What effects does shared mobility have on traditional business models of car dealers and car manufacturers in terms of production and sales?
- How can dealerships and manufacturers react to these effects?
- How important is it for car dealers and car manufacturers to deal with shared mobility in order to be successful in the future?
- What is the main reason to invest in car sharing? Do car manufacturers and car dealers expect to make a profit with car sharing or do they do it with the purpose of advertising the brand and its new models?
- Even if car sharing is not profitable, would it help your business in other ways?
- If car dealers want to include car sharing in their business model, what are the most important issues they have to tackle in order to succeed?
- [Question only to car dealers] What happens with vehicles after they have been used for car sharing. Are they suitable for the used-car market?

External factors

- Which external factors influence the car sharing market? Please address all those that you find to be relevant.
- What are the differences between offering car sharing in an urban area vs. a rural area?
- Why are there fewer car sharing providers in rural areas? Could car dealers begin offering car sharing in rural and less densely populated areas?
- How do you rate the relation between quality of public transportation system of a city and the potential of car sharing services?
- What are the differences of the German car sharing market compared to other markets? Is there more potential in Germany?
- [Question only car manufacturer] Is there higher potential for German car dealers to include car sharing in their business models when comparing it to the Portuguese and American market?

Final questions

- Do you think that car sharing will play an important role in the next 10 years?
- Would you do anything different, when entering the car sharing market now?

Wrap-up

“This brings us to the end of our interview and I would like to thank you for your time. Do you have any questions or further comments that you would like to add? Thank you once again.”

Appendix 8: Interview results

Topic	Car manufacturer (EXPERT 1) (45 min.)	Shared mobility provider (EXPERT 2) (45 min.)	Car dealer 1 (EXPERT 3) (60 min.)	Car dealer 2 (EXPERT 4) (60 min.)	Car dealer 3 (EXPERT 5)
Responsibility	Sales for future mobility	CEO of mobility platform that connects mobility providers with customers	CEO of car dealership	CEO of car dealership	CEO of car dealership
Period of dealing with car sharing	Personal experience with car sharing for 7 years	Professional start in 2015	6 years	Since 2013. More in depth for 2 years.	They do not deal with car sharing anymore. In total, it was provided 1 year.
Car sharing business model	Free-floating car sharing model	Platform for e-car-sharing providers	Station-based car sharing in cooperation with Ford and Flinkster. IT is used from Ford, would not be possible without it. (Partnerships are important when implementing car sharing): Advantage for customers: Possible to book vehicles in whole Germany with any Ford partner. Vehicles stay at fixed location (24/7) Maintenance check of vehicles every 14 days.	Station-based electric B2B car sharing with the goal to make electric mobility divisible. Reaching end customers via B2B. Usual process: Employer provides car sharing parking lot. End customers (employees) register with personal data. It gives companies the opportunity that employees arrive at work by public transport and then use individual shared mobility if needed. Advantage: Avoiding costs for a high number of parking lots	Station-based car sharing in cooperation with Ford and Flinkster.
Locations of car sharing vehicles	[no answer]	Worldwide access (platform) but focus on Germany	First 3 vehicles. Today 50 vehicles in different cities and municipalities. Big operation area and a lot of local partnerships (Partners take on maintenance of vehicles).	Official start with 60 vehicles. Plan for end of 2020: 320 vehicles Pain point: charging infrastructure. Originally solely EVs were planned but charging stations are missing, so that in beginning conventional cars are included.	4 vehicles parked at train station
Profitability of car sharing	Mostly negative. Positive in some big cities.	Positive in big cities. No high profit for small companies in big cities.	Nowadays difficult to make a lot of money with car sharing. More likely a Marketing project (positive press, WOM, easier access to customers) Solely car sharing is often a 0 business but increases maintenance services etc. which increases profit. "We currently reach the positive area regarding profit (this took some time since it is a long process)".	It depends on how cars for car sharing are purchased. Moreover, insurance is important factor Car dealers have the advantage that this is their core competency: Purchase, sales, fleet management, fleet costs Car sharing vehicles have positive effect on value chain due to repair, maintenance. All of this leads to additional income	Difficult in rural areas due to long walking distances
Number of customers	Number of customers high in high population density areas which have a reasonable traffic situation. Cities with a lot of traffic will lower attractiveness.	[no answer]	Currently around 2,000 customers. For the last 3 months, 2-3 registrations daily (high increase).	[no answer]	[no answer]

Topic	Car manufacturer (EXPERT 1) (45 min.)	Shared mobility provider (EXPERT 2) (45 min.)	Car dealer 1 (EXPERT 3) (60 min.)	Car dealer 2 (EXPERT 4) (60 min.)	Car dealer 3 (EXPERT 5)
Intensity of competition	[no answer]	Car sharing is competitive market in bigger cities. Unequal distribution of market share (big players dominate market).	EXPERT 3 does not have direct competition.	EXPERT 4 does not have direct competition. New concept: Reaching end customer through B2B, Competitive advantage of EXPERT 4: Modern and easy-to-use app (generated in-house together with a local IT startup), digital driver's license validation (easier registration process), cheap insurance also for 18 years old customers, good booking tool, Artificial Intelligence in app (e.g. measures battery charging status or possible distance to travel)	[not asked]
Purposes of car sharing and travel distances	[not asked]	Mostly used for short distances or in order to test new vehicles. Travel distance often between 10 and 20km.	Intermodal use of small vehicles (use of car sharing after the arrival with train at train station) since it is more cost effective than taxis; In cities, a lot of customers do not have a car. In rural areas this is not the case (car sharing is usually used additionally in rural areas); Vans are most successful in the car sharing fleet of EXPERT 3: Used for weekend trips, sport clubs, transportation of bigger items; Travel distance for small vehicles: Short Travel distance of busses: Longer, often even weekend trips (often used instead of rental car because pricing is less expensive)	Model of EXPERT 4: End customers use it within the city at the workplace. For example, to visit a friend after work or to go grocery shopping. More likely short travel distances.	Usually between 5 and 10km. Rarely more than 50km.
Customer segment	There is no typical customer: Second vehicle customer, intramodal mobility customer, business travelers, partygoers. Main turnover comes from taxi replacement.	Modern customers, mostly between 20 and 40 years old.	Varied customer segment. Sport clubs (vans) or private persons.	Depending on B2C or B2B. Model of EXPERT 4: Companies want to offer less parking lots since they are very expensive (Therefore they want employees to arrive by public transportation and then use car sharing if needed)	[not asked]
Reasons why people do not use car sharing services	Walking distance to pick-up location of vehicle is too long (this barrier increases with bad weather). Time-consuming process of registration.	Technology barrier: registration process Barrier of high diversity: lack of uniform platform	[not asked]	[not asked]	Walking distances

Topic	Car manufacturer (EXPERT 1) (45 min.)	Shared mobility provider (EXPERT 2) (45 min.)	Car dealer 1 (EXPERT 3) (60 min.)	Car dealer 2 (EXPERT 4) (60 min.)	Car dealer 3 (EXPERT 5)
Influence of pricing on success of car sharing model	If car sharing is nearly as expensive as taxi rides, customer will most likely prefer to take a taxi.	Pricing varies strongly between providers. Example: SIXT offers EV for 9 Cent/min, while SHARENOW charges up to 36 Cent/min. Tendency goes to 36 Cent/min. in order to be worth it for provider (cheaper than a taxi but more expensive than public transport)	Pricing is important. In order to be competitive, EXPERT 3 offers car sharing cheaper than the usual Ford Car sharing price (3 €/hour less for small vehicles), 9-seat busses cost 5€ per hour or 50€ per day (cheaper area) instead of the Ford price of 9€ and 80€ "Lower prices help to increase attractiveness and to gain customers."	Pricing depends on point of view if customer compares it with public transportation costs or costs for own car. In general, pricing is important	Pricing of Ford car sharing model was reasonable (Fuel and insurance included in price).
Influence of walking distance to pick-up location on success of car sharing model	Very crucial success factor	Walking distance of approximately 400m-500m is fine (especially in bigger cities where the own car often cannot be park before the own house too)	Up to 500m is fine. Distances above are too far. Different case for small busses (vans) because customers arrive at the pick-up location with their own car.	The closer the better. Model of EXPERT 4 usually offers short walking distances since parking lots are in the underground car park of the employer	[not asked]
Characteristics of a city to be suitable for car sharing	Free-floating car sharing: Parking locations are important; Station-based car sharing: distance and way to vehicle location are important. Not only the size of a city is important but also population density. Success depends on a lot of different aspects.	Regarding EVs: Good charging infrastructure. Cities have to take a lot of responsibility for that. Free-floating: Car sharing will succeed solely electric in urban areas (reasons: emission and noises) Station-based: more flexibility and no clearly defined criteria for the city since renting periods are longer (more similar to traditional car rental models)	Not size is important but willingness of customers to try the service. Station-based car sharing can also work in new residential areas, where residents could forego their second vehicle.	Works best in young and open-minded cities. In the case of EXPERT 4: a lot of commuters come into the city every morning. EXPERT 4 thinks that they can also go into small cities. They think about going into cities with around 10000 inhabitants, offering their model at gas stations. In these small cities car sharing can be used when there is bad public transport and no busses after 6pm.	[not asked]
Attractiveness of car sharing offering electric vehicles	Acceptance among municipalities increases for Evs since they want to lower environmental pollution. This leads to a higher willingness to offer parking lots.	Currently E-Car-sharing is seen as more attractive since people want to test EVs. Using EVs in car sharing can positively change customer's attitude towards EVs. In terms less attractive since it is more expensive.	Offer of 12 electric vehicles (out of 50). Compared to other vehicles the EVs in the fleet are the ones with the worst capacity (used less). Reasons: Car sharing is usually a spontaneous use. EVs bring barriers because a lot of customers do not know how to use it (charging cable, use, charging pole). Due to a lot of barriers the use is lower. Governments and municipalities prefer electric vehicles.	Within cities it is more attractive because the acceptance is higher. Mega trend is not only sharing but sharing electric.	[not asked]

Topic	Car manufacturer (EXPERT 1) (45 min.)	Shared mobility provider (EXPERT 2) (45 min.)	Car dealer 1 (EXPERT 3) (60 min.)	Car dealer 2 (EXPERT 4) (60 min.)	Car dealer 3 (EXPERT 5)
Success of e-carsharing market	[not asked]	10% of car sharing vehicles in Germany are currently EVs. EVs might be more booming in the future.	[not asked]	[not asked]	[not asked]
Current challenges of car dealers	Biggest challenges with regard to car sharing: Develop and operation of app; Networking with vehicle (opening and closing mechanism, connection to app); Process of authorization (driver's license); Logistical challenges and costs: Refueling, relocating vehicles, maintenance	[not asked]	[not asked]	Disruptive change in automotive industry: Price transparency; Car manufacturer want to sell new vehicles themselves (online channels); Show room concepts in cities which threatens car dealers; Products are transparent	no answer
Current opportunities of car dealers	[no answer]	[not asked]	[not asked]	All challenges lead to opportunities: It is important for car dealers to react to trends and changes; Car dealers have to understand new technology and use digitalization as a chance to strengthen core business (e.g. workflow optimization, process optimization); Car dealers can find new growth factors within the value chain; Important to become mobility provider; Car dealers have to become more independent of manufacturer (This can be done by advertising the car dealership itself instead of using the brand of the manufacturer in ads). Important: Reacting proactively and not waiting what happens	Online and direct sales All-round carefree packages
Development of vehicle sales in the future	Depends on politics of countries. Decreases in Europe, grows in India and China Sales is often restricted by political restrictions on city entry of vehicles or maximal number of vehicles per household	Vehicle sales in Germany (and Europe) will decrease. It will increase in China and Africa. Overall, it will be relativized and most likely stagnate.	[not asked]	From the perspective of car dealers: Sales will decrease in the future for new vehicles, maybe even disappear (depending on new retail formats, platform economy etc.) For the next years the used vehicle sales will increase. But not sure for how long. In general sales for car dealers will decrease	International increase but maybe not for long; Decrease in Germany

Topic	Car manufacturer (EXPERT 1) (45 min.)	Shared mobility provider (EXPERT 2) (45 min.)	Car dealer 1 (EXPERT 3) (60 min.)	Car dealer 2 (EXPERT 4) (60 min.)	Car dealer 3 (EXPERT 5)
Could car sharing be a reason that vehicle sales decrease	Car sharing could limit sales in cities with political restrictions (e.g. London or Paris: access control of vehicles) when car sharing is allowed in the city center.	Not a perfect alternative for the own car. More likely an addition. Main reason for decrease of vehicles is environmental awareness and urbanization which offers various opportunities to waive own car. Car sharing is a side reason.	[not asked]	In bigger cities car sharing could be a reason. For example Berlin: Apartment in city center and possible to choose between various shared mobility services every day: no need for own car Different in rural areas. Answering this question depends highly on region and target group.	[not asked]
Influence of shared mobility on traditional business models	Characteristics of vehicles change. Car owner finds quality, brand, design of purchased vehicle important. Car sharing provider finds availability and costs important (importance of brand decreases) Not hardware (vehicle) is priority brand, instead brand of provider is priority.	Shared mobility often used as complementary business model. Shared vehicles do not take a big proportion of produced vehicles but OEMs and car dealers want to try out new concepts and learn for the future.	Equipment of car sharing vehicles has to be different in order to offer broad range of application: e.g. trailer hitch, adjustable seats.	[see above]	[not asked]
Possibilities for OEMs and car dealers to react to effects of changing business models	It is important that OEMs offer a sharing brand themselves which enables them to influence the vehicles used. Car dealers can offer shared mobility services as a service provider.	[not asked]	[see above]	Important: Reacting proactively Customer oriented thinking, strengthen core business but also implementing new ideas/business models Adapting company structure	[not asked]
Importance for OEMs and car dealers to deal with shared mobility in order to be successful in the future	It is important to deal with this topic since it is the future. Different approaches are being tested.	It is very important so that they get to know alternatives. For car dealers usually not very useful in bigger cities since free-floating car sharing offer is high.	Very important to try new things in order to stay competitive in the future. Being a mobility provider means seeing new opportunities and being open towards new technology (instead of only focusing on the traditional model of selling and repairing vehicles)	Car dealers should see it as a chance, also in smaller economic regions. If done right it is more likely a chance instead of a negative development. According to one's lights it is very important that car dealers deal with this topic. Not as a solely business but additionally to current business model. Even profit is 0 or small it can still be worth it for other reasons or when looking at the whole value chain.	It is part of the future business model.

Topic	Car manufacturer (EXPERT 1) (45 min.)	Shared mobility provider (EXPERT 2) (45 min.)	Car dealer 1 (EXPERT 3) (60 min.)	Car dealer 2 (EXPERT 4) (60 min.)	Car dealer 3 (EXPERT 5)
Reasons why OEMs and car dealers invest in car sharing.	Sharing is used for "Learning". Testing what is profitable and what not. Looking in the future.	[not asked]	<p>Answered in perspective of car dealers:</p> <p>Important to try out alternative mobility concepts;</p> <p>Topics such as car sharing and e-mobility gain in importance;</p> <p>Less people will have their own car, more people will use vehicles sporadically;</p> <p>Marketing tool;</p> <p>Positive customer experience;</p> <p>Paid test drives;</p> <p>Improvement of image of car dealership;</p> <p>Today, car dealers are not only car dealers but also mobility providers</p>	<p>Answered in perspective of car dealers:</p> <p>Good image;</p> <p>In the beginning, profit is not in focus;</p> <p>Collection of data (it is possible to collect a lot of data of customers such as driving behavior);</p> <p>Data enables to offer customers individual tailored offers;</p> <p>Data helps to get closer to customers and to position oneself right in front of customers;</p> <p>Customers get more easily aware of brand;</p> <p>Vehicles are visible in market (advertising)</p>	<p>Answered in perspective of car dealers</p> <p>Not profit. Instead: Advertisement and test drives</p>
Does car sharing help the business even if it is not profitable?	More and more municipalities will restrict the individual ownership of vehicles. It helps to gain experience if and how to make money with sharing concepts: Learning	[not asked]	[see above]	[see above]	[see above]
Success factors for car dealers when involving car sharing in their business model	<p>Access to platform and IT;</p> <p>Well-developed linkage to vehicles;</p> <p>Sufficient vehicle fleet (which ideally also generates other income);</p> <p>Parking lots for shared vehicles;</p> <p>Major driver is utilization (determines if it is worth it)</p>	<p>Car dealers should offer station-based car sharing;</p> <p>Advantages are that dealers already have resources and infrastructure;</p> <p>Car dealers with good locations have potential.</p>	<p>Car dealers have to offer station-based car sharing: This is the only model that works in rural areas where only a few vehicles can be offered.</p> <p>Locations of vehicles have to be a central point in city/municipality.</p> <p>Adjustment of vehicles, financing volume, communication (answering individual question of customers, explaining model)</p> <p>Implementation requires intensive support.</p> <p>Already with 20 to 25 users who use the shared vehicle as a second car, it would be worth it for EXPERT 3. This means: It is not necessary to have a lot of users but a good capacity.</p>	<p>Staying power;</p> <p>Willingness to invest of stakeholders;</p> <p>Acceptance within company (within car dealership) is important;</p> <p>If e-carsharing: good charging infrastructure</p>	<p>Good location (central e.g. at train station, easy to reach)</p>
Purpose of car sharing vehicles after use	[not asked]	[not asked]	<p>Sale after 12 to 24 months of usage in car sharing fleet in used vehicle market.</p> <p>They are purchased and sold like other vehicles.</p>	<p>Sale like other vehicles.</p> <p>Currently it is planned to sell them after 24 months</p>	<p>Sale in used vehicles market, usually after 12 months of usage.</p> <p>Advantage for dealer: very small loss in value</p>

Topic	Car manufacturer (EXPERT 1) (45 min.)	Shared mobility provider (EXPERT 2) (45 min.)	Car dealer 1 (EXPERT 3) (60 min.)	Car dealer 2 (EXPERT 4) (60 min.)	Car dealer 3 (EXPERT 5)
External factors that influence car sharing	Availability of parking lots in a city influences if it makes sense to own car (monthly costs); Availability of parking lots for car sharing vehicles; Quality of public transportation; Traffic in a city; Quality of provider	Technological change; Electric mobility; Improvement of charging infrastructure for EVs; Climate changes which influence political requirements; Quality of connectivity of home and therefore, importance of own car. The less important own car, the more chances for car sharing	The more expensive the maintenance of own car and the harder it is to find parking, the more attractive car sharing gets compared to owning a car. Car sharing is suitable for one-way drives or shorter roundtrips. Not suitable for the way to work when the car would be parked and unused for hours. Main driver: costs of car sharing compared to own car	Politics have to learn to give subsidies not only for public transportation but also for individual mobility (shared) Increase of charging station for EVs is very important. This can only happen if governments support it. Economic: The better the purchase price of vehicles and the leasing rate, the easier it is to involve/offer car sharing	[not answered]
Differences between car sharing in rural and urban areas.	[not asked]	No free-floating in rural areas; Different targeting of customers (more aimed for station-based); Good locations for station-based car sharing are crucial; Different customer segment	[not asked]	There is a lot of potential in rural areas; it is a different model than the urban free-floating model; In rural areas the model must be station-based car sharing which also allows booking in advance (in order to lower risk for users)	City: Free-floating Rural: Station-based
Influence of public transportation on success of car sharing	Public transportation users are more likely to share a car (they are used to share things);	Hard to answer since car sharing models are mostly in cities with good public transportation systems.	Public transportation is quite bad in rural areas in Germany. Therefore, most people in rural areas own a car. Bad public transport can also be an opportunity. Car sharing may be used instead of busses or even be provided by municipalities since it might be cheaper than investing in more busses	In case of the model of EXPERT 4: The better the public transportation system, the more successful car sharing. Reason for that is that they want commuters to arrive at work by public transport and then use our car sharing within the city. This only works if public transport is well and has high quality. An integrated concept is important (partnerships between public transport firms, government, municipalities, companies)	The better the public transportation system, the more successful car sharing since the two services can complement another.

Topic	Car manufacturer (EXPERT 1) (45 min.)	Shared mobility provider (EXPERT 2) (45 min.)	Car dealer 1 (EXPERT 3) (60 min.)	Car dealer 2 (EXPERT 4) (60 min.)	Car dealer 3 (EXPERT 5)
Differences between German car sharing market to other markets	<p>Ecological factors plead for Europe. However, costs in Europe are often high.</p> <p>Germany/Portugal: Importance of vehicle in Portugal is much higher than in Germany (status symbol). Therefore, individual mobility is more important in Portugal.</p> <p>Germany/USA: Travel distances are longer and cities are designed for cars. Bad public transportation systems (LA does not have public transportation; everybody owns a car). Own vehicle plays a very important role in the USA (much more important than in Germany).</p> <p>Regarding shared mobility, ride hailing (Uber) is way important than car sharing.</p>	<p>In Germany, car sharing is a luxury good that came to the market additionally.</p> <p>Germany is very open-minded towards car sharing.</p> <p>Car sharing is difficult to enforce in a lot of American cities: willingness of customers is low, long travel distances, different architecture, a lot of parking lots available, purchase of vehicles compared to other countries cheap.</p>	[not answered]	Some Scandinavian countries are much more advanced than Germany regarding shared mobility since they offer a universal mobility concept (integrated), accessible from only one platform.	[not known]
Potential of car dealers to offer car sharing in rural areas	<p>Could work but difficult: Usually only possible as a franchise partner of an umbrella brand which provides IT.</p>	<p>Yes, there is potential.</p> <p>Various case studies in Germany that show that it can work.</p>	<p>Yes. Not the free-floating model works but station based.</p> <p>Municipalities often support rural car sharing because public transport in rural areas is bad.</p> <p>Also, B2B car sharing is possible in cities of any size. For example for retirement homes or rehab stations. A lot of companies want to offer car sharing in addition to their own fleet (cheaper than the investment in the purchase of new vehicles)</p>	Yes, a lot of potential for station-based car sharing	Could work out but did not work for EXPERT 5
Importance of car sharing in the next 10 years.	<p>Car sharing where the driver drives oneself might decline. Ride hailing companies will gain in importance.</p> <p>Penetration of car sharing will come with autonomous vehicles.</p>	<p>Yes, it will be important in 10 years.</p>	<p>Yes, it will be important.</p> <p>Importance will increase a lot with autonomous driving. When even in rural areas the pick-up distance is not a barrier anymore because the car sharing vehicle drives itself to the customer.</p>	Yes, it will be important and will be part of mobility	Not sure
Factors done differently if entering the car sharing market again.	[not asked]	<p>Focus on a more modern target group.</p>	<p>Would do the same: important to start step by step and do a lot of advertising, WOM and information (it is a long process, one cannot just put 20 vehicles somewhere over night and hope that it will work)</p>	<p>Would do the same: Patience in terms of e mobility (due to charging stations, etc.)</p>	Would do the same.

Appendix 9: Business models of interviewees including their evaluation of their own car sharing model

Expert	Business Model	Expert's own assessment of car their respective sharing model
Expert 1	Global free-floating car sharing model: vehicles are booked via app on an on-demand basis, price calculated by minutes or kilometers.	Free-floating model only works in big cities with high population density.
Expert 2	Mobility platform that connects mobility providers with customers (specialized on electric car sharing).	Electric car sharing works well in cities with good charging infrastructure.
Expert 3	Car dealership offering station-based B2C car sharing in cooperation with Ford Carsharing and Flinkster.* They started with 3 vehicles and are operating with 50 vehicles in various cities today (6 years after implementation).	In the beginning not profitable. Nowadays, positive range is reached. Positive experience regarding Marketing, image, value chain, test drives
Expert 4	Car dealership offering station-based electric B2B car sharing using its own independent IT and platform. Target is to reach end customers via companies: companies provide parking (charging station); employees register with their private data. Thus, B2B model helps to reach/attract end customers. Official start with 60 vehicles in November 2019. Target for end of 2020: 320 vehicles.	Positive experience regarding Marketing and value chain. Advantage: business model is applicable in cities of any size. Pain point: charging infrastructure is underdeveloped
Expert 5	Car dealership offering station-based B2C car sharing in cooperation with Ford Carsharing and Flinkster.* They offered 4 car sharing vehicles for a period of 1 year. Today, the car dealer does not offer car sharing anymore.	Demand was low (see Appendix 10)

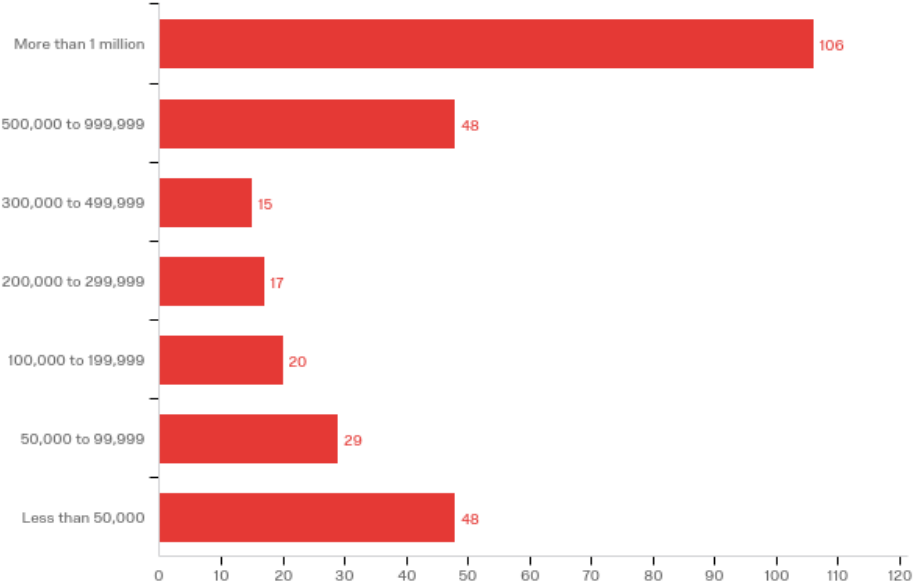
* Ford Carsharing is a nationwide car sharing program that integrates car dealerships. It is a collaboration with Flinkster, the car sharing service of the German railway company. Ford Carsharing does not only operate in urban but also in rural areas, offering station-based car sharing which can be booked in advance (Ford, 2019). Flinkster is the car sharing of the German railway company Deutsche Bahn.

Appendix 10: Unsuccessful case study of the implementation of car sharing at a car dealership.

As stated by one expert, car sharing in a rural area did not work out for him. (S)he “offered car sharing for one year involving 4 vehicles and then stopped because it was not profitable”. It is hard to square this unsuccessful attempt with the remaining experts’ viewpoints. Without further information, one can only speculate the reasons underlying this failure: a period of one year was too short for the business to show its full potential (or lack thereof), the location (base station) was not accessible enough, there was insufficient communication of the new car sharing offer, the fleet size was inappropriate, advance booking was perhaps not offered or congruent with fleet size. Other reasons could be that the population in the city where the service was offered was not open to shared mobility or that connecting public transportation was missing. To our mind, this unsuccessful experience would be an interesting (if negative) case study that might help answer the research questions that motivated the current study.

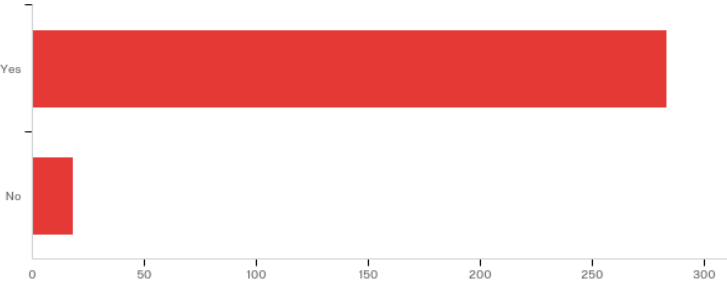
Appendix 11: Survey questions and results

Q1 - Approximately how many inhabitants does the city you live in have?



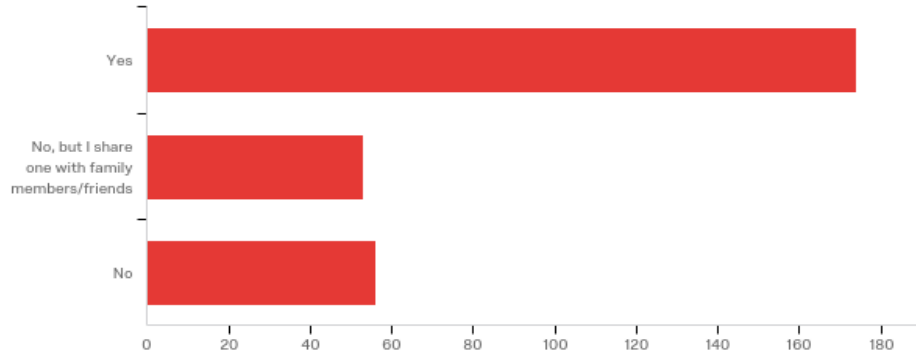
#	Answer	%	Count
1	More than 1 million	37.46%	106
2	500,000 to 999,999	16.96%	48
3	300,000 to 499,999	5.30%	15
4	200,000 to 299,999	6.01%	17
5	100,000 to 199,999	7.07%	20
6	50,000 to 99,999	10.25%	29
7	Less than 50,000	16.96%	48
	Total	100%	283

Q2 - Do you hold a driver’s license?



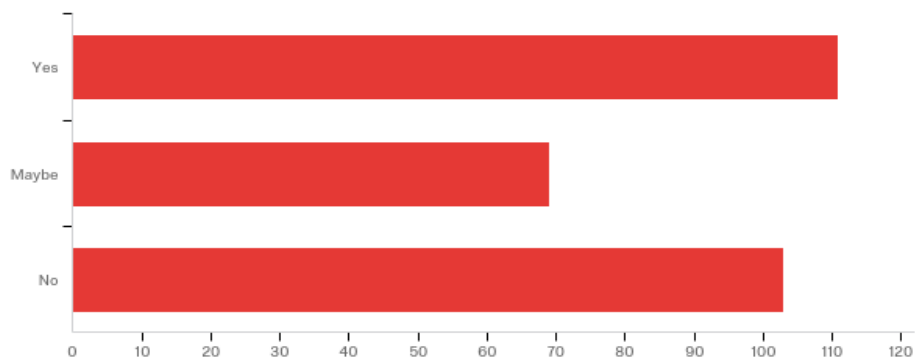
#	Answer	%	Count
1	Yes	94.02%	283
2	No	5.98%	18
	Total	100%	301

Q3 - Do you own a car



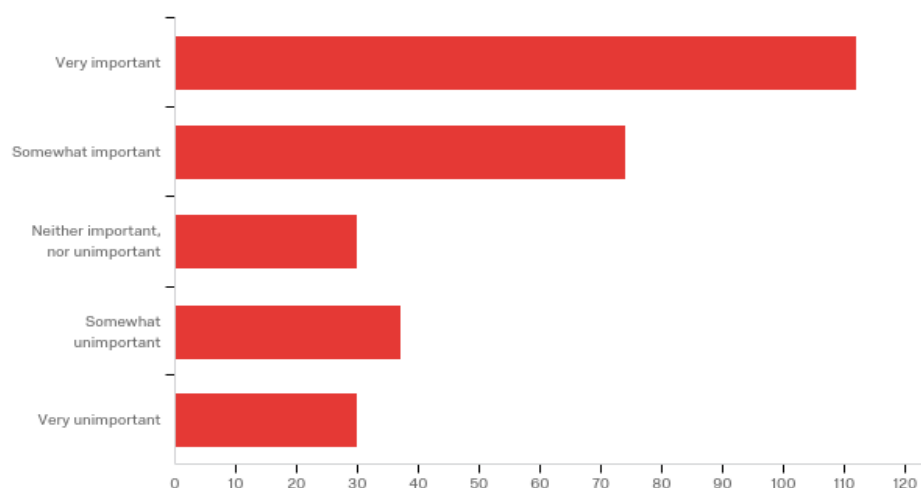
#	Answer	%	Count
1	Yes	61.48%	174
2	No, but I share one with family members/friends	18.73%	53
3	No	19.79%	56
	Total	100%	283

Q4 - Could you currently afford buying a new car that meets your needs?



#	Answer	%	Count
1	Yes	39.22%	111
2	Maybe	24.38%	69
3	No	36.40%	103
	Total	100%	283

Q5 - How important is owning a car to you?



#	Answer	%	Count
1	Very important	39.58%	112
2	Somewhat important	26.15%	74
3	Neither important, nor unimportant	10.60%	30
4	Somewhat unimportant	13.07%	37
5	Very unimportant	10.60%	30
	Total	100%	283

Germany:

#	Answer	%	Count
1	Very important	35.77%	44
2	Somewhat important	21.95%	27
3	Neither important, nor unimportant	14.63%	18
4	Somewhat unimportant	12.20%	15
5	Very unimportant	15.45%	19
	Total	100%	123

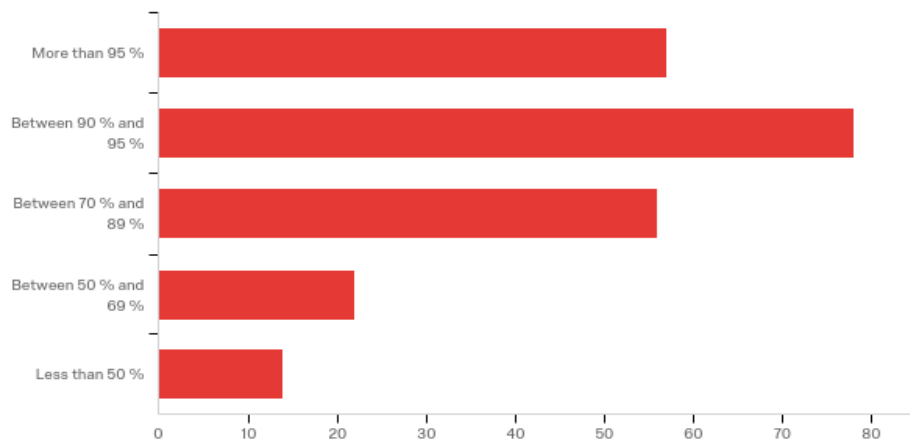
Portugal:

#	Answer	%	Count
1	Very important	39.53%	17
2	Somewhat important	39.53%	17
3	Neither important, nor unimportant	9.30%	4
4	Somewhat unimportant	9.30%	4
5	Very unimportant	2.33%	1
	Total	100%	43

USA:

#	Answer	%	Count
1	Very important	69.39%	34
2	Somewhat important	18.37%	9
3	Neither important, nor unimportant	6.12%	3
4	Somewhat unimportant	4.08%	2
5	Very unimportant	2.04%	1
	Total	100%	49

Q6 - How much time a day is your car parked?

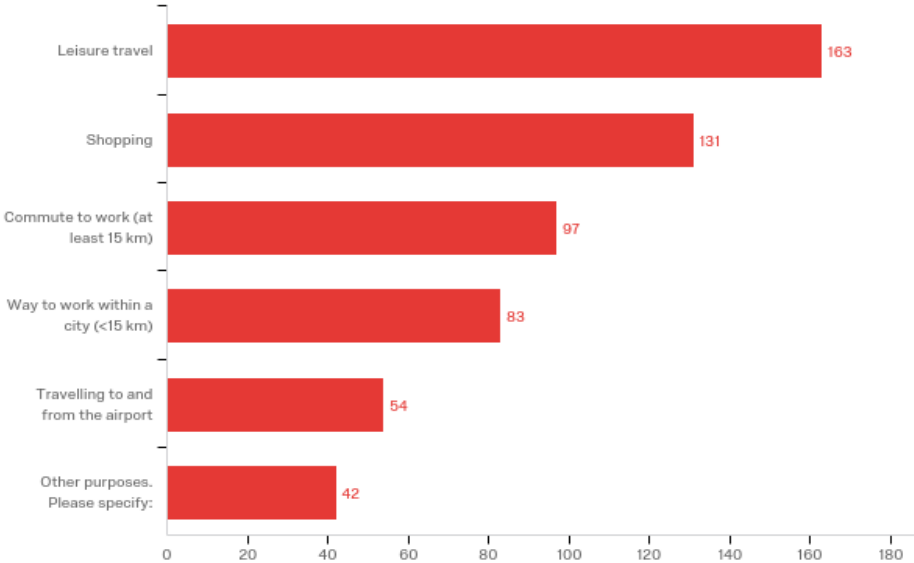


#	Answer	%	Count
1	More than 95 %	25.11%	57
2	Between 90 % and 95 %	34.36%	78
3	Between 70 % and 89 %	24.67%	56
4	Between 50 % and 69 %	9.69%	22
5	Less than 50 %	6.17%	14
	Total	100%	227

Car Owners:

#	Answer	%	Count
1	More than 95 %	27.01%	47
2	Between 90 % and 95 %	35.63%	62
3	Between 70 % and 89 %	22.41%	39
4	Between 50 % and 69 %	9.77%	17
5	Less than 50 %	5.17%	9
	Total	100%	174

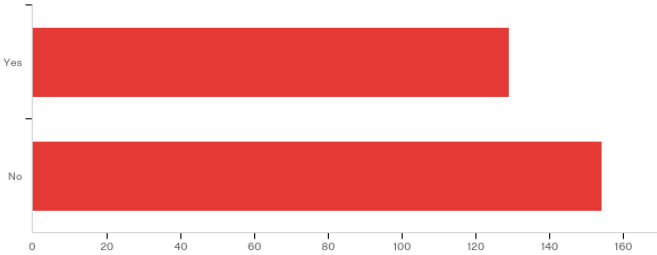
Q7 - For what purposes do you use your car? You may choose more than one answer.



#	Answer	%	Count
1	Shopping	22.98%	131
2	Way to work within a city (<15 km)	14.56%	83
3	Commute to work (at least 15 km)	17.02%	97
4	Leisure travel	28.60%	163
5	Travelling to and from the airport	9.47%	54
6	Other purposes. Please specify:	7.37%	42
	Total	100%	570

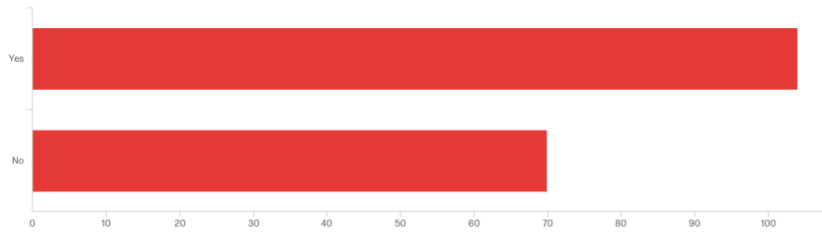
Other purposes:
 Way to school; Weekend trips; Free time activities; Drop off, pick up kids to schools and after school classes; Gym; Business purposes; Drive to train; Visit friends and family; Camping; Skiing trips;

Q8 - Have you ever visited a car dealership to purchase a car or to gather information regarding new models?



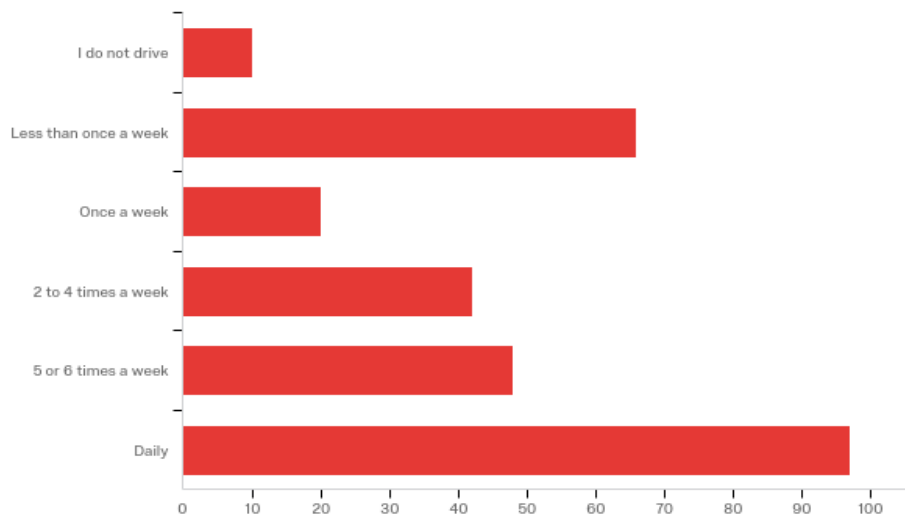
#	Answer	%	Count
1	Yes	45.58%	129
2	No	54.42%	154
	Total	100%	283

Car owners:



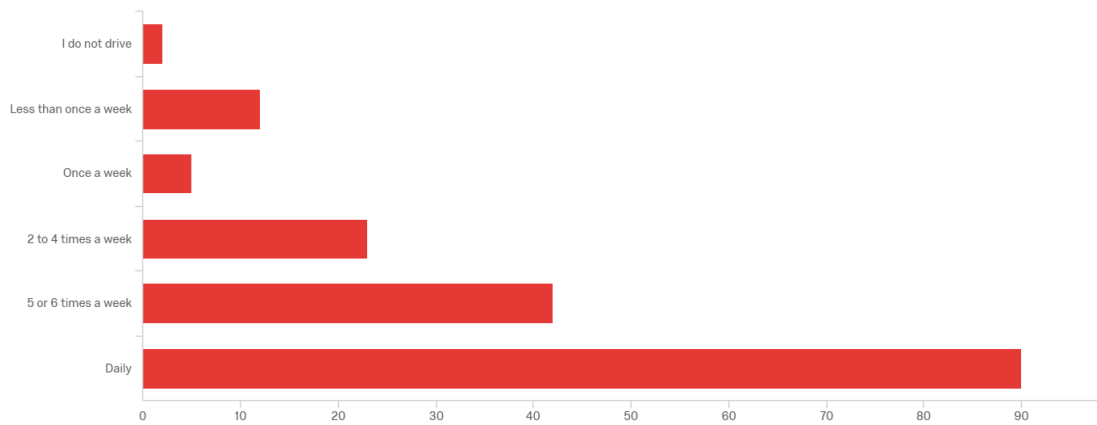
#	Answer	%	Count
1	Yes	59.77%	104
2	No	40.23%	70
	Total	100%	174

Q9 - How often do you drive a car?



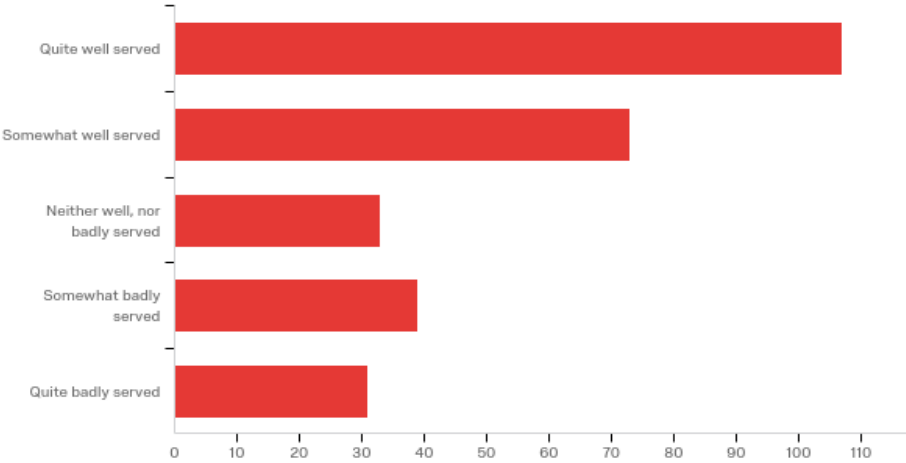
#	Answer	%	Count
1	I do not drive	3.53%	10
2	Less than once a week	23.32%	66
3	Once a week	7.07%	20
4	2 to 4 times a week	14.84%	42
5	5 or 6 times a week	16.96%	48
6	Daily	34.28%	97
	Total	100%	283

Car owners:



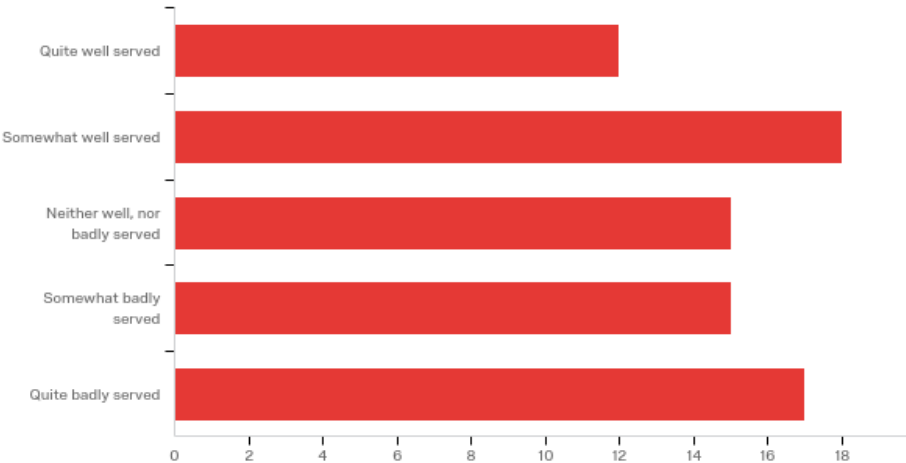
#	Answer	%	Count
1	I do not drive	1.15%	2
2	Less than once a week	6.90%	12
3	Once a week	2.87%	5
4	2 to 4 times a week	13.22%	23
5	5 or 6 times a week	24.14%	42
6	Daily	51.72%	90
	Total	100%	174

Q10 - Is your home well served by public transportation?



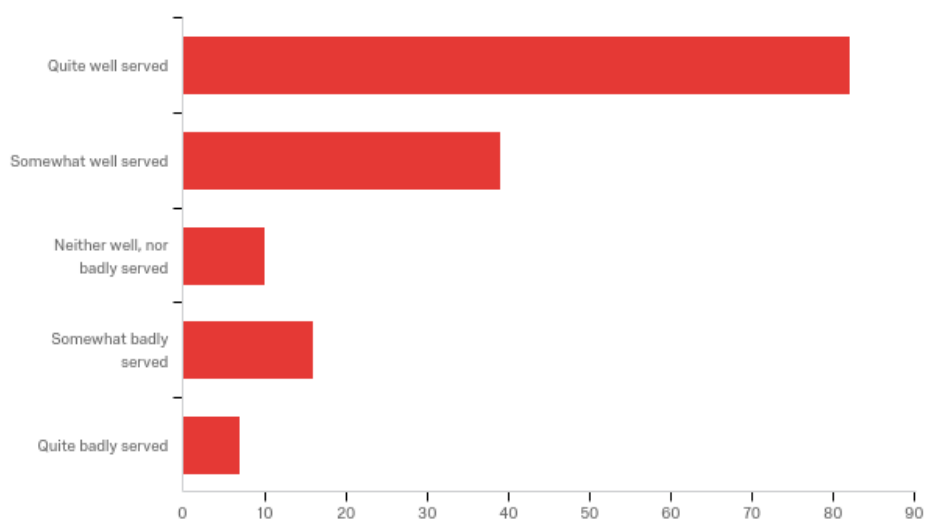
#	Answer	%	Count
1	Quite well served	37.81%	107
2	Somewhat well served	25.80%	73
3	Neither well, nor badly served	11.66%	33
4	Somewhat badly served	13.78%	39
5	Quite badly served	10.95%	31
	Total	100%	283

Small cities (<100 000):



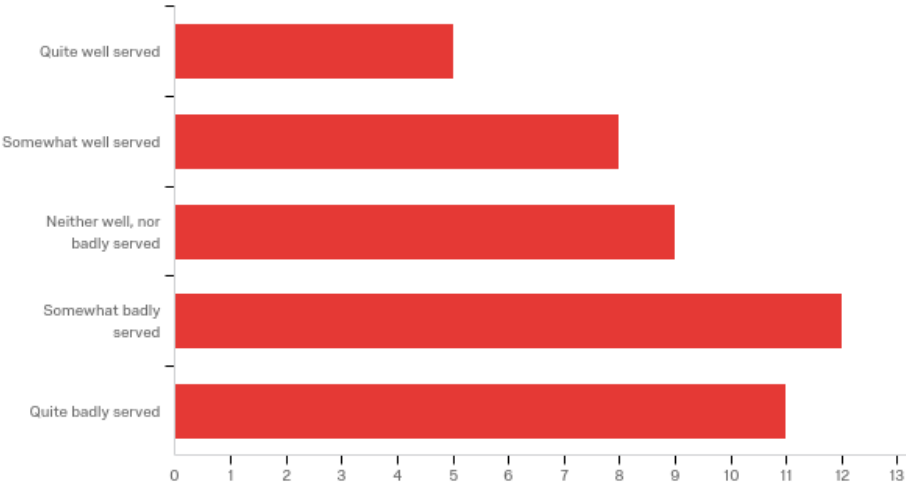
#	Answer	%	Count
1	Quite well served	15.58%	12
2	Somewhat well served	23.38%	18
3	Neither well, nor badly served	19.48%	15
4	Somewhat badly served	19.48%	15
5	Quite badly served	22.08%	17
	Total	100%	77

Big cities (>500 000):



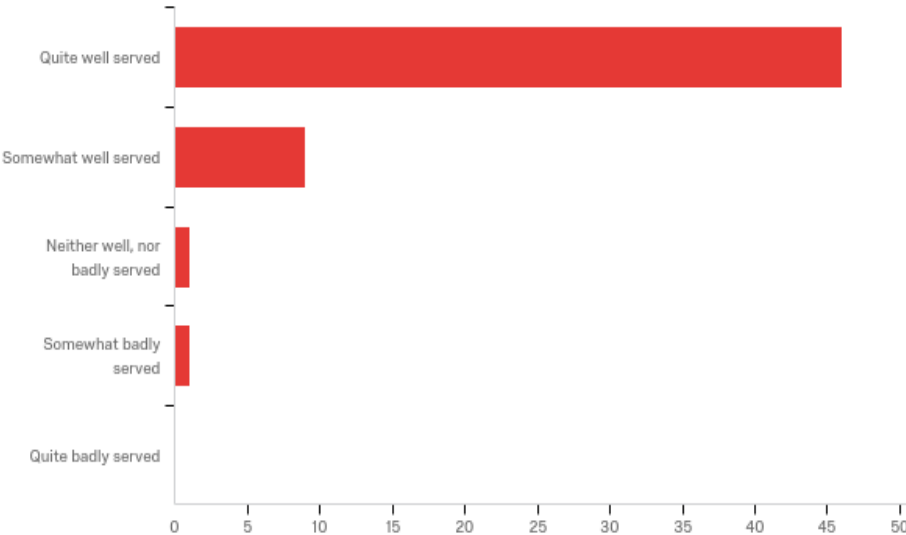
#	Answer	%	Count
1	Quite well served	53.25%	82
2	Somewhat well served	25.32%	39
3	Neither well, nor badly served	6.49%	10
4	Somewhat badly served	10.39%	16
5	Quite badly served	4.55%	7
	Total	100%	154

Small cities in Germany (<100 000):



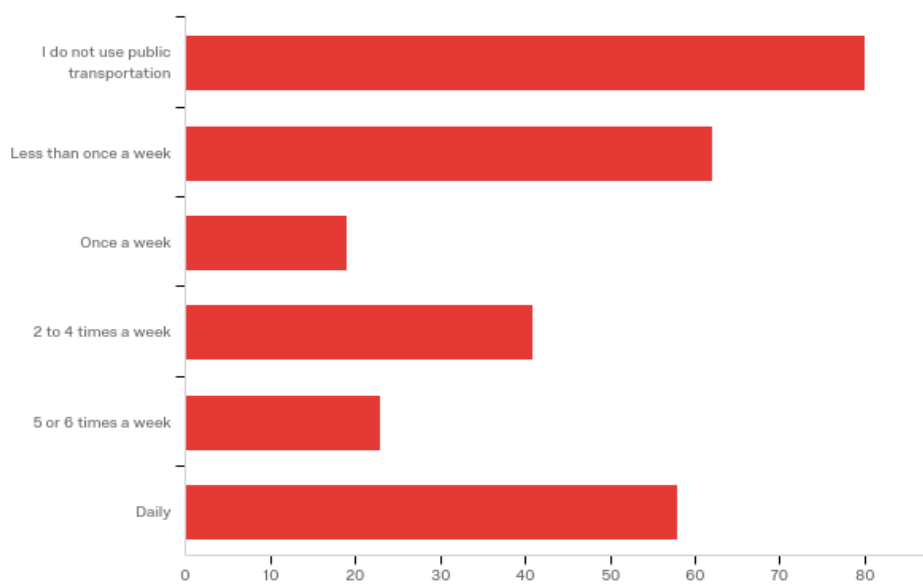
#	Answer	%	Count
1	Quite well served	11.11%	5
2	Somewhat well served	17.78%	8
3	Neither well, nor badly served	20.00%	9
4	Somewhat badly served	26.67%	12
5	Quite badly served	24.44%	11
	Total	100%	45

Big cities in Germany (>500 000):



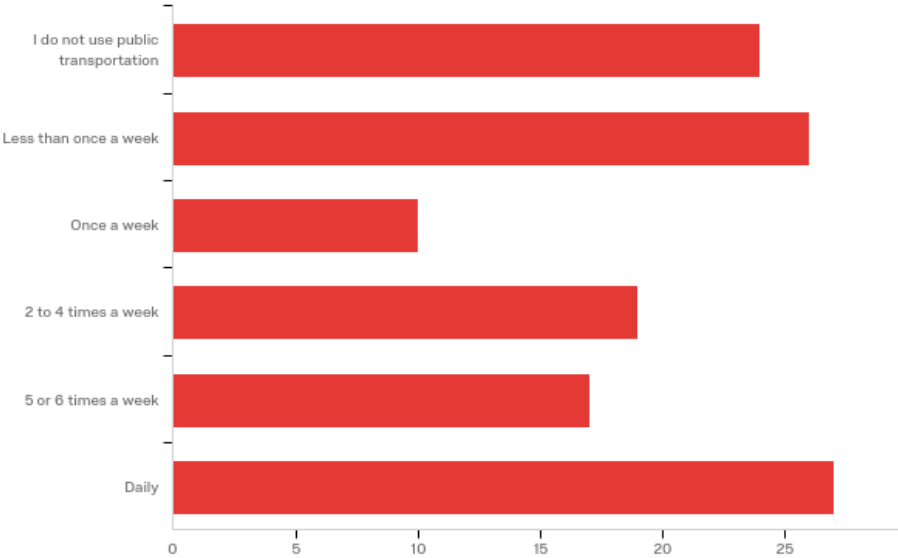
#	Answer	%	Count
1	Quite well served	80.70%	46
2	Somewhat well served	15.79%	9
3	Neither well, nor badly served	1.75%	1
4	Somewhat badly served	1.75%	1
5	Quite badly served	0.00%	0
	Total	100%	57

Q11 - How often do you use public transportation?



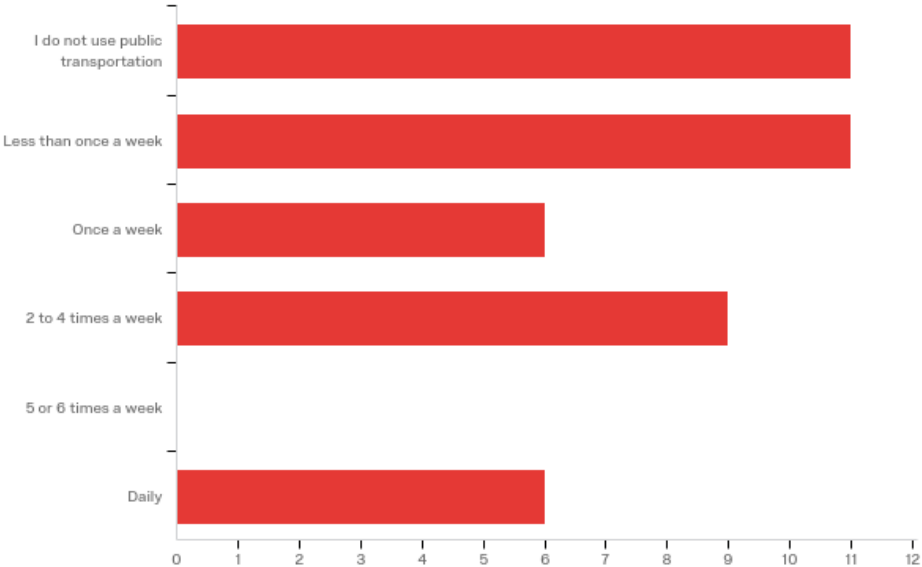
#	Answer	%	Count
1	I do not use public transportation	28.27%	80
2	Less than once a week	21.91%	62
3	Once a week	6.71%	19
4	2 to 4 times a week	14.49%	41
5	5 or 6 times a week	8.13%	23
6	Daily	20.49%	58
	Total	100%	283

Germany:



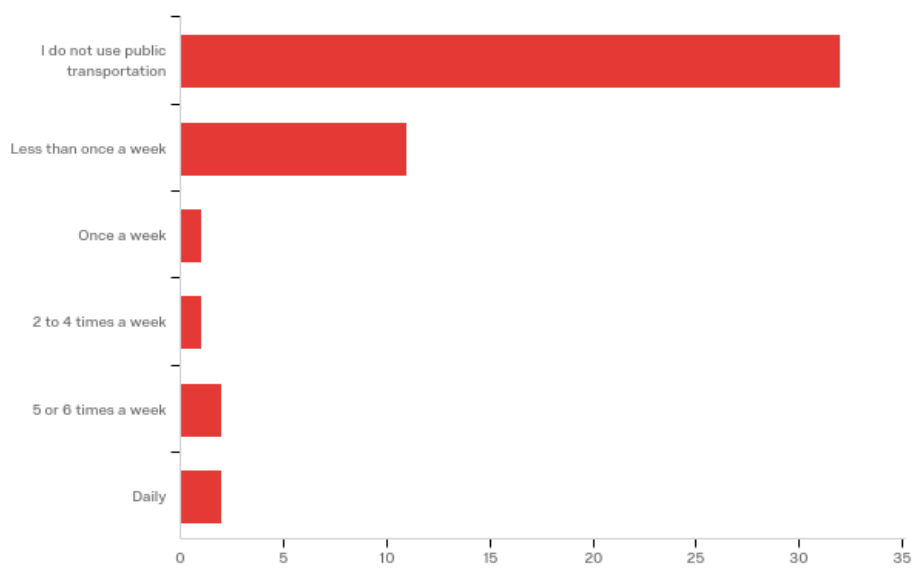
#	Answer	%	Count
1	I do not use public transportation	19.51%	24
2	Less than once a week	21.14%	26
3	Once a week	8.13%	10
4	2 to 4 times a week	15.45%	19
5	5 or 6 times a week	13.82%	17
6	Daily	21.95%	27
	Total	100%	123

Portugal:



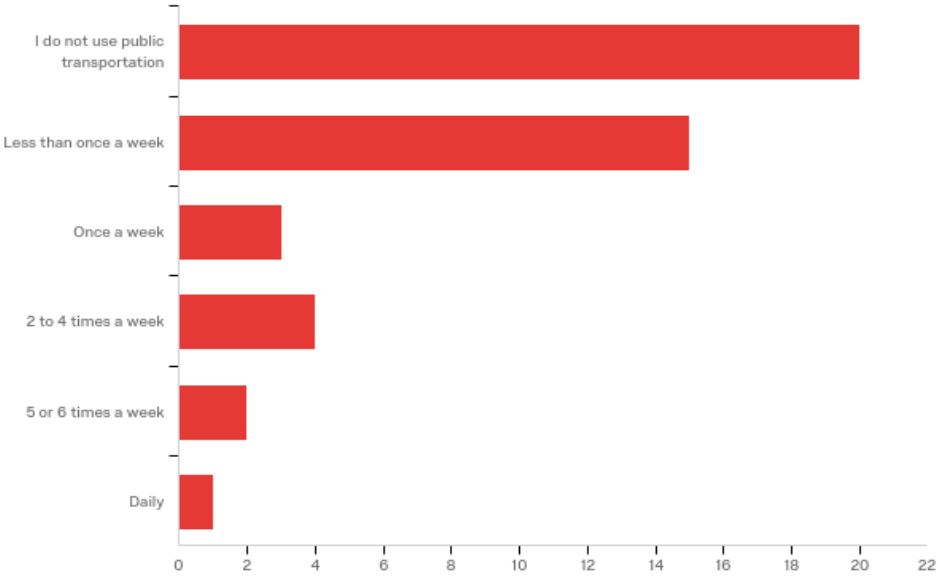
#	Answer	%	Count
1	I do not use public transportation	25.58%	11
2	Less than once a week	25.58%	11
3	Once a week	13.95%	6
4	2 to 4 times a week	20.93%	9
5	5 or 6 times a week	0.00%	0
6	Daily	13.95%	6
	Total	100%	43

USA:



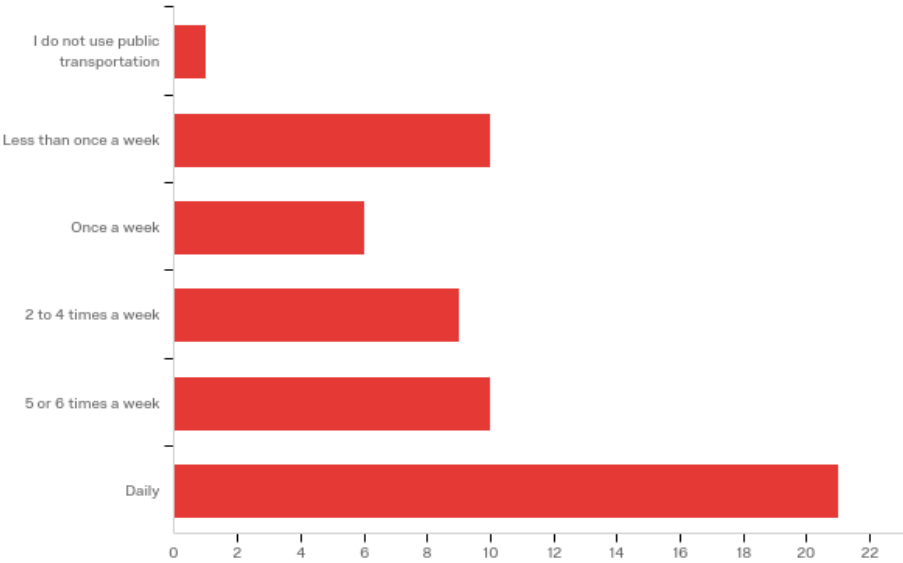
#	Answer	%	Count
1	I do not use public transportation	65.31%	32
2	Less than once a week	22.45%	11
3	Once a week	2.04%	1
4	2 to 4 times a week	2.04%	1
5	5 or 6 times a week	4.08%	2
6	Daily	4.08%	2
	Total	100%	49

Germany, small cities (<100 000):



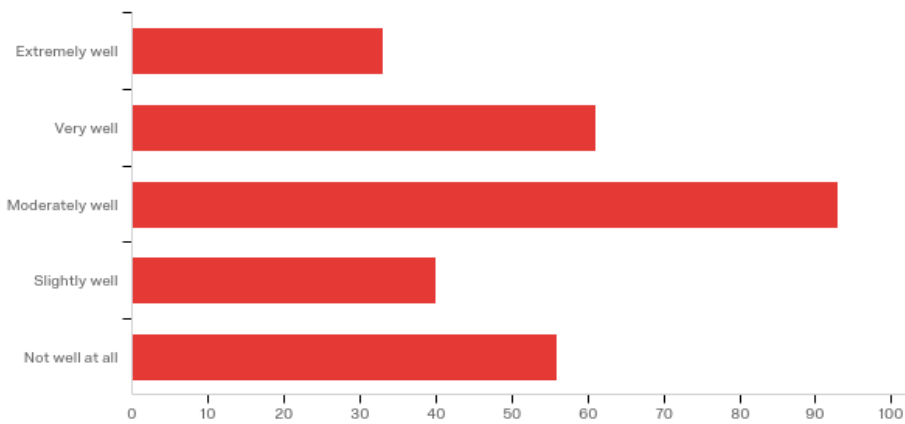
#	Answer	%	Count
1	I do not use public transportation	44.44%	20
2	Less than once a week	33.33%	15
3	Once a week	6.67%	3
4	2 to 4 times a week	8.89%	4
5	5 or 6 times a week	4.44%	2
6	Daily	2.22%	1
	Total	100%	45

Germany, big cities (>500 000):



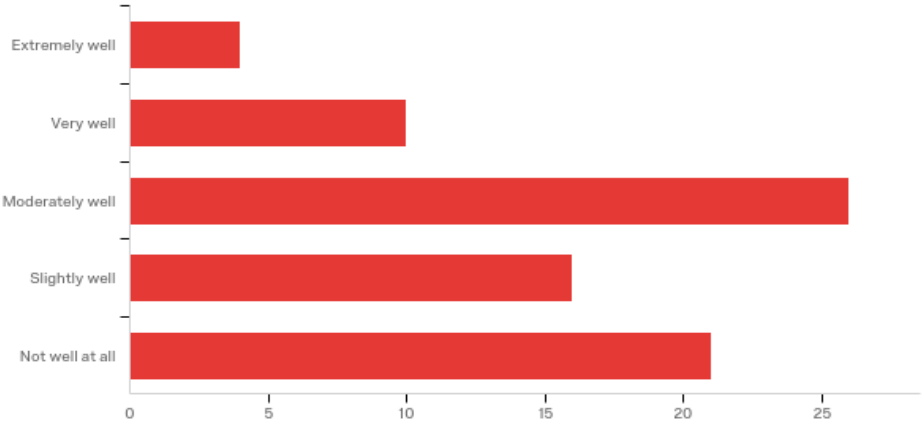
#	Answer	%	Count
1	I do not use public transportation	1.75%	1
2	Less than once a week	17.54%	10
3	Once a week	10.53%	6
4	2 to 4 times a week	15.79%	9
5	5 or 6 times a week	17.54%	10
6	Daily	36.84%	21
	Total	100%	57

Q12 - How well informed are you about car sharing services?



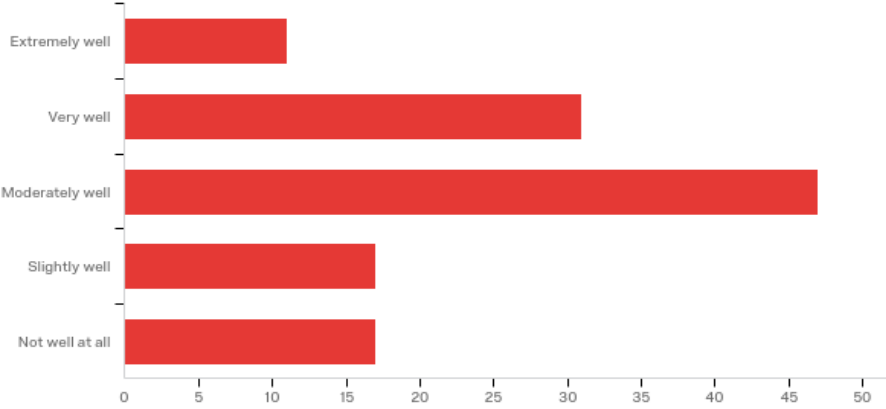
#	Answer	%	Count
1	Extremely well	11.66%	33
2	Very well	21.55%	61
3	Moderately well	32.86%	93
4	Slightly well	14.13%	40
5	Not well at all	19.79%	56
	Total	100%	283

Small cities (<100,000):



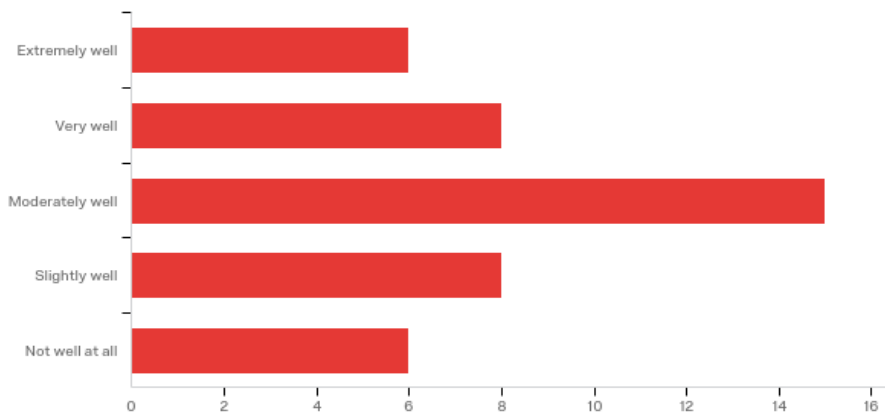
#	Answer	%	Count
1	Extremely well	5.19%	4
2	Very well	12.99%	10
3	Moderately well	33.77%	26
4	Slightly well	20.78%	16
5	Not well at all	27.27%	21
	Total	100%	77

Germany:



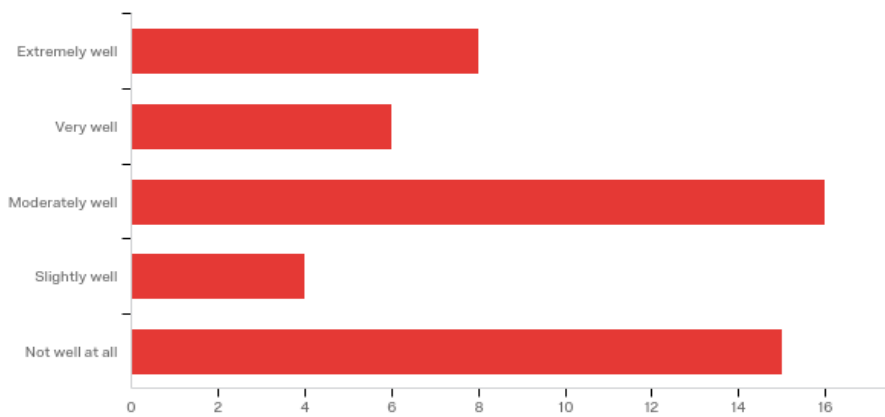
#	Answer	%	Count
1	Extremely well	8.94%	11
2	Very well	25.20%	31
3	Moderately well	38.21%	47
4	Slightly well	13.82%	17
5	Not well at all	13.82%	17
	Total	100%	123

Portugal:



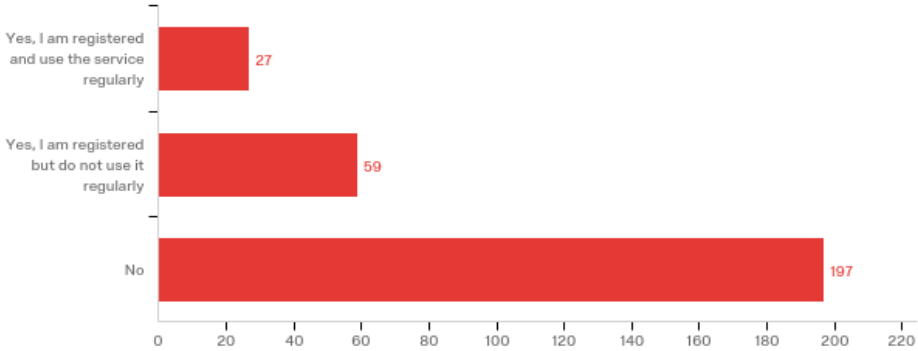
#	Answer	%	Count
1	Extremely well	13.95%	6
2	Very well	18.60%	8
3	Moderately well	34.88%	15
4	Slightly well	18.60%	8
5	Not well at all	13.95%	6
	Total	100%	43

USA:



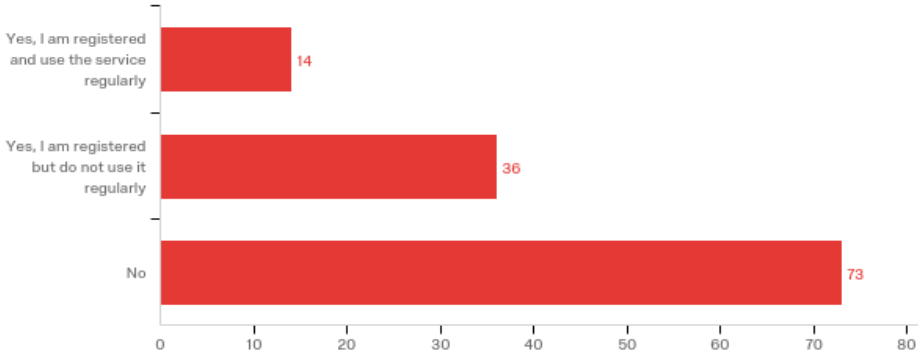
#	Answer	%	Count
1	Extremely well	16.33%	8
2	Very well	12.24%	6
3	Moderately well	32.65%	16
4	Slightly well	8.16%	4
5	Not well at all	30.61%	15
	Total	100%	49

Q13 - Are you registered with a car sharing provider?



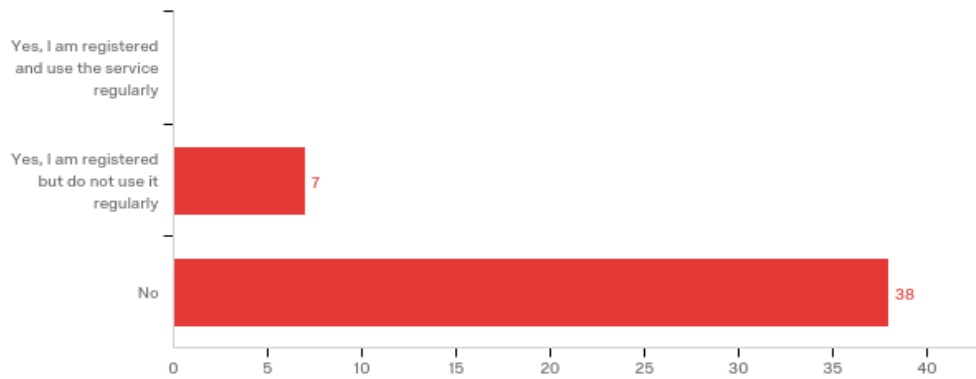
#	Answer	%	Count
1	Yes, I am registered and use the service regularly	9.54%	27
2	Yes, I am registered but do not use it regularly	20.85%	59
3	No	69.61%	197
	Total	100%	283

Germany:



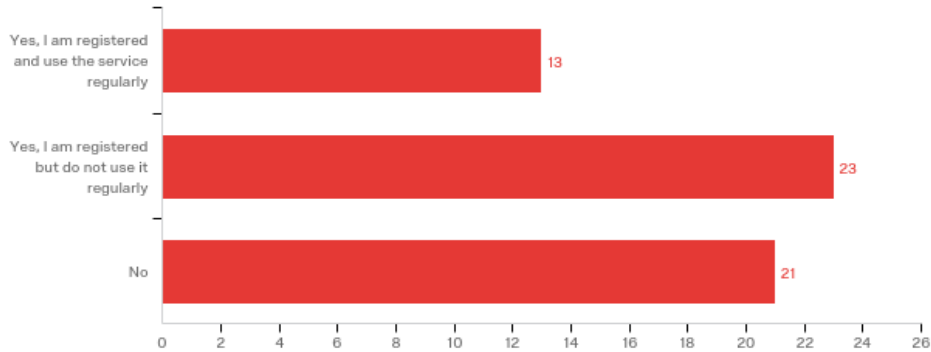
#	Answer	%	Count
1	Yes, I am registered and use the service regularly	11.38%	14
2	Yes, I am registered but do not use it regularly	29.27%	36
3	No	59.35%	73
	Total	100%	123

Small cities in Germany (<100 000):



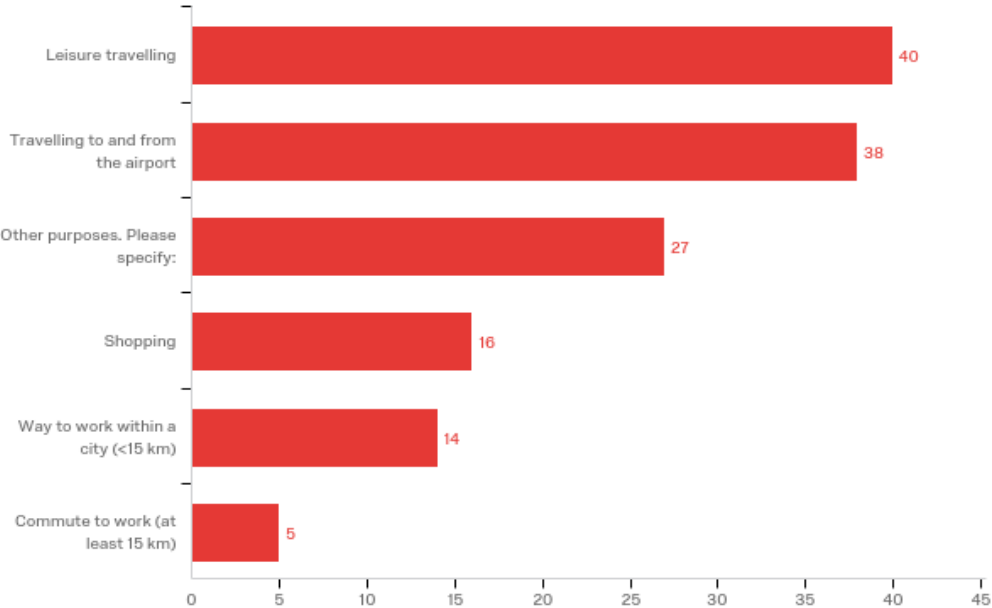
#	Answer	%	Count
1	Yes, I am registered and use the service regularly	0.00%	0
2	Yes, I am registered but do not use it regularly	15.56%	7
3	No	84.44%	38
	Total	100%	45

Big cities in Germany (>500 000):



#	Answer	%	Count
1	Yes, I am registered and use the service regularly	22.81%	13
2	Yes, I am registered but do not use it regularly	40.35%	23
3	No	36.84%	21
	Total	100%	57

Q14 - For what purposes do you use car sharing? You may choose more than one answer.

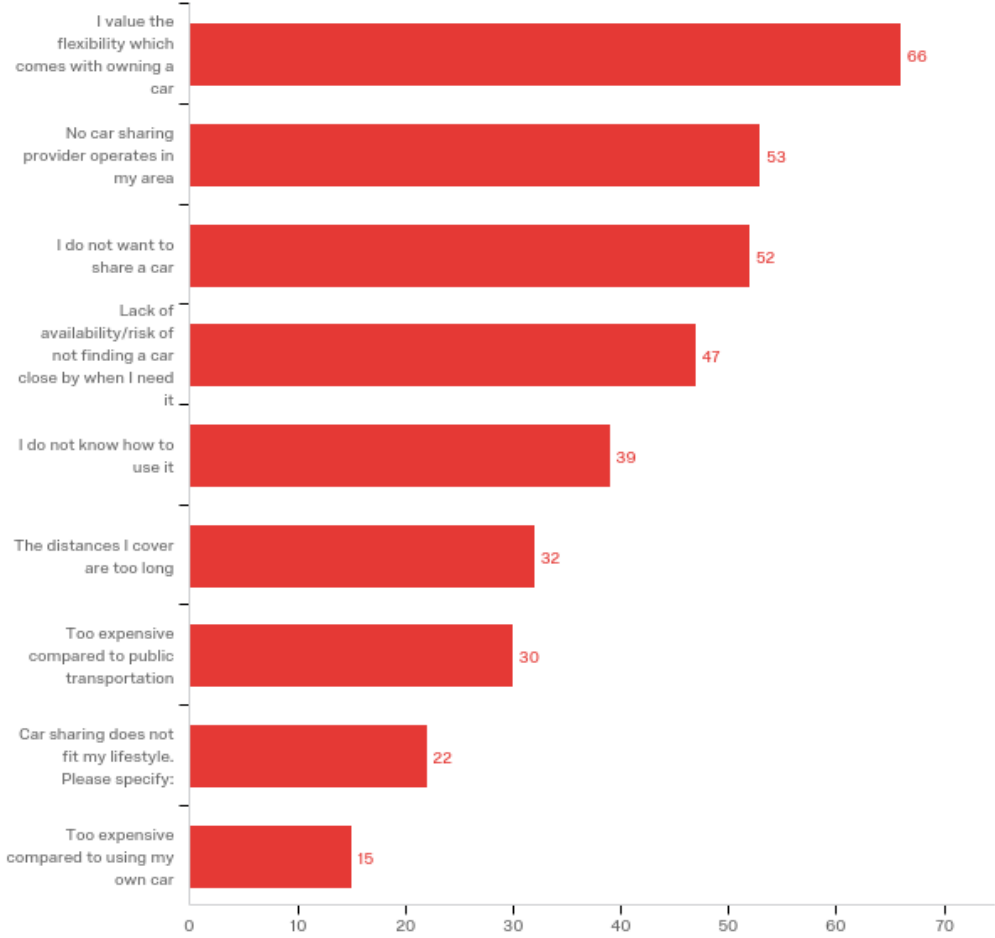


#	Answer	%	Count
1	Shopping	11.43%	16
2	Way to work within a city (<15 km)	10.00%	14
3	Commute to work (at least 15 km)	3.57%	5
4	Leisure travelling	28.57%	40
5	Travelling to and from the airport	27.14%	38
6	Other purposes. Please specify:	19.29%	27
	Total	100%	140

Other purposes:

Going out; Spontaneous trips; Business trip; No taxi available near me; Relocation; Travelling outside public transportation hours; Transporting big items; In other cities where I don't have a car;

Q15 - What are the reasons for not being registered with a car sharing provider? You may choose more than one answer.

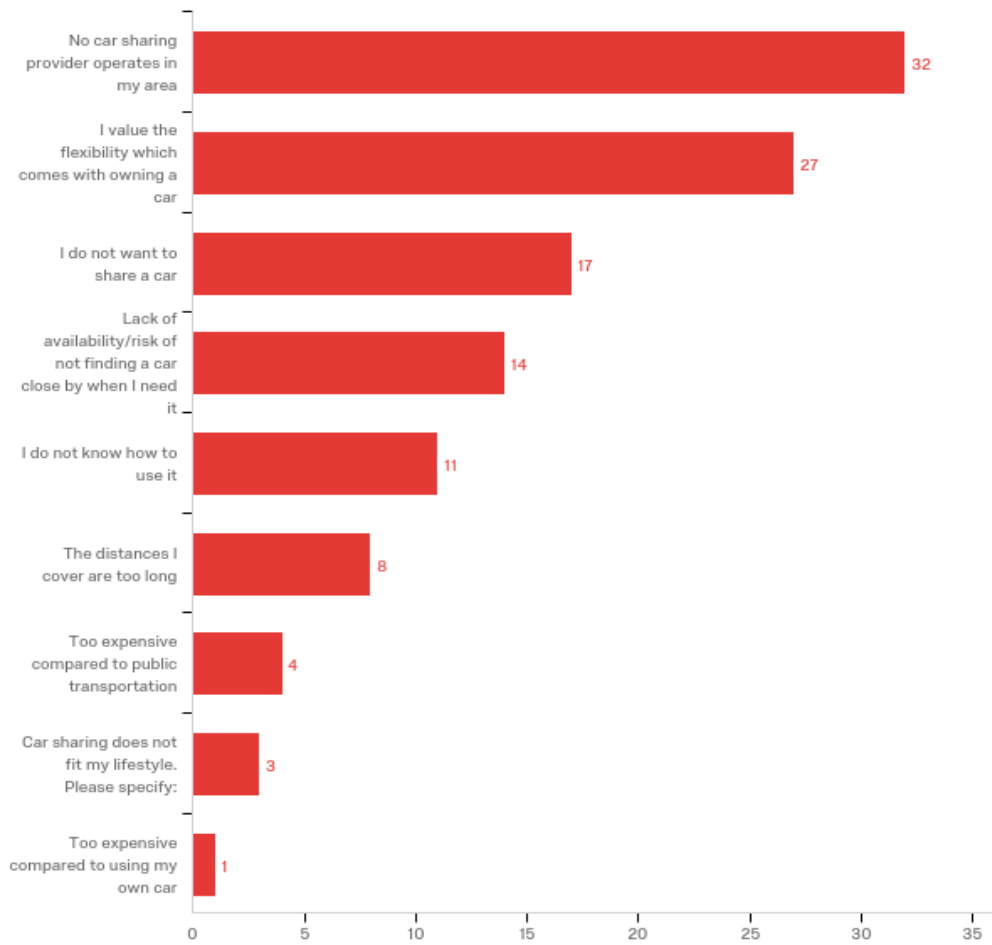


#	Answer	%	Count
1	Lack of availability/risk of not finding a car close by when I need it	13.20%	47
2	The distances I cover are too long	8.99%	32
3	No car sharing provider operates in my area	14.89%	53
4	I value the flexibility which comes with owning a car	18.54%	66
5	I do not want to share a car	14.61%	52
6	Too expensive compared to public transportation	8.43%	30
7	Too expensive compared to using my own car	4.21%	15
8	I do not know how to use it	10.96%	39
9	Car sharing does not fit my lifestyle. Please specify:	6.18%	22
	Total	100%	356

Other reasons:

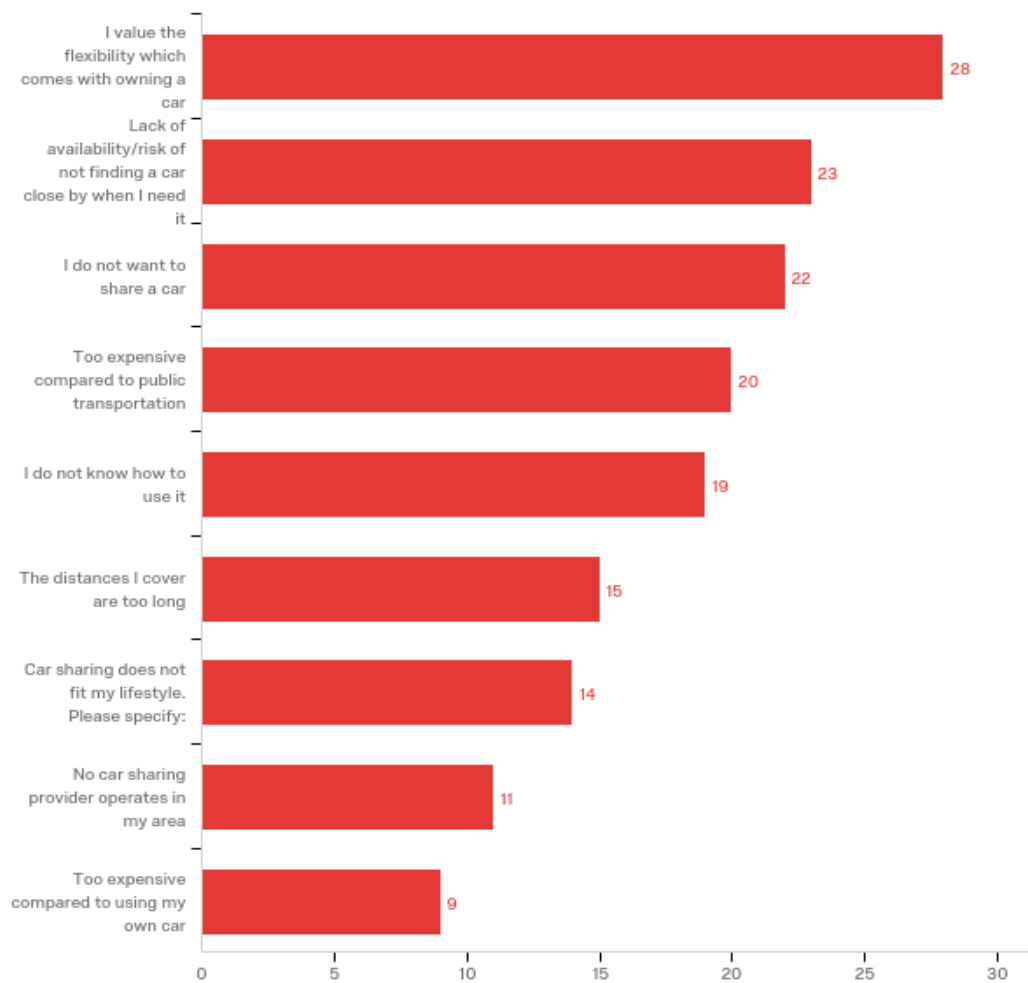
Too dependent on car; Too inconvenient; Preference of Uber over car sharing; Car seats for kids; I have a garage; I need a car daily; Preference of bicycle; Preference of public transportation; Public transportation is better for the environment

Small cities (<100 000):



#	Answer	%	Count
1	Lack of availability/risk of not finding a car close by when I need it	11.97%	14
2	The distances I cover are too long	6.84%	8
3	No car sharing provider operates in my area	27.35%	32
4	I value the flexibility which comes with owning a car	23.08%	27
5	I do not want to share a car	14.53%	17
6	Too expensive compared to public transportation	3.42%	4
7	Too expensive compared to using my own car	0.85%	1
8	I do not know how to use it	9.40%	11
9	Car sharing does not fit my lifestyle. Please specify:	2.56%	3
	Total	100%	117

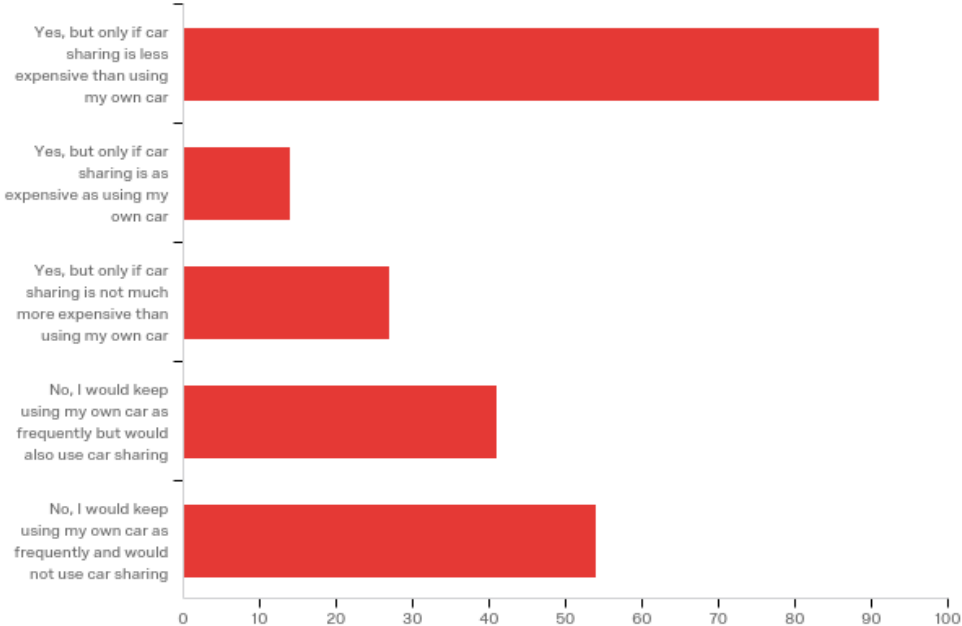
Big cities (>500 000):



#	Answer	%	Count
1	Lack of availability/risk of not finding a car close by when I need it	14.29%	23
2	The distances I cover are too long	9.32%	15
3	No car sharing provider operates in my area	6.83%	11
4	I value the flexibility which comes with owning a car	17.39%	28
5	I do not want to share a car	13.66%	22
6	Too expensive compared to public transportation	12.42%	20
7	Too expensive compared to using my own car	5.59%	9
8	I do not know how to use it	11.80%	19
9	Car sharing does not fit my lifestyle. Please specify:	8.70%	14
	Total	100%	161

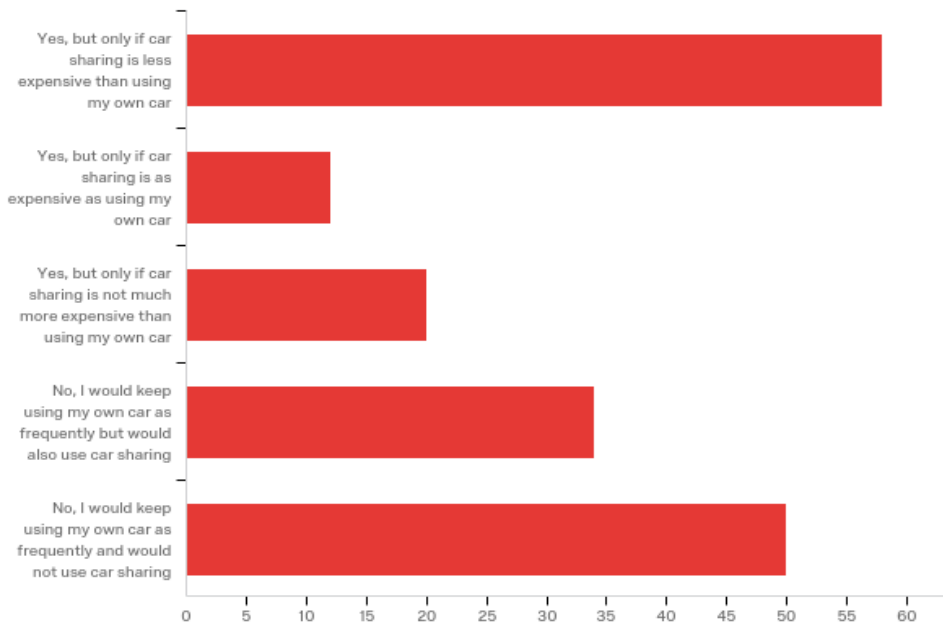
Q16 - Would you consider using your own car less frequently if there was a well-developed car sharing network in your city?

Car owners and non-car owners, but shared with family or friends



#	Answer	%	Count
1	Yes, but only if car sharing is less expensive than using my own car	40.09%	91
2	Yes, but only if car sharing is as expensive as using my own car	6.17%	14
3	Yes, but only if car sharing is not much more expensive than using my own car	11.89%	27
4	No, I would keep using my own car as frequently but would also use car sharing	18.06%	41
5	No, I would keep using my own car as frequently and would not use car sharing	23.79%	54
	Total	100%	227

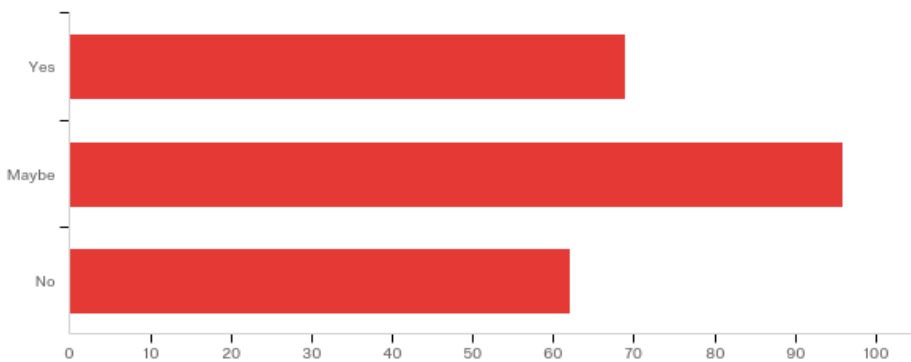
Car owners:



#	Answer	%	Count
1	Yes, but only if car sharing is less expensive than using my own car	33.33%	58
2	Yes, but only if car sharing is as expensive as using my own car	6.90%	12
3	Yes, but only if car sharing is not much more expensive than using my own car	11.49%	20
4	No, I would keep using my own car as frequently but would also use car sharing	19.54%	34
5	No, I would keep using my own car as frequently and would not use car sharing	28.74%	50
	Total	100%	174

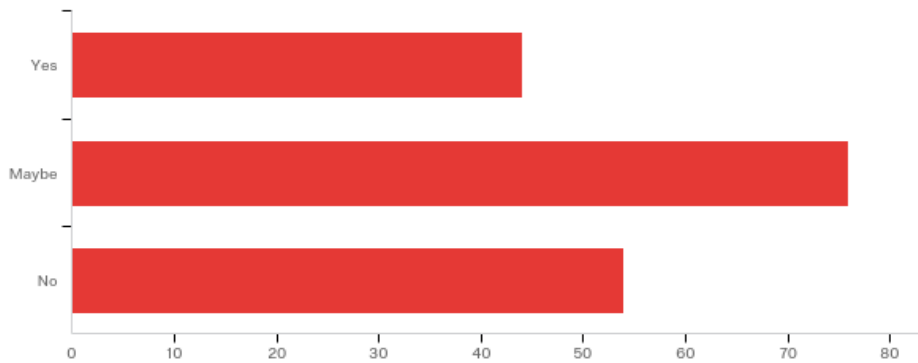
Q17 - Would you consider not buying a new car if there was a well-developed car sharing network in your city?

Car owners and non-car owners, but shared with family or friends



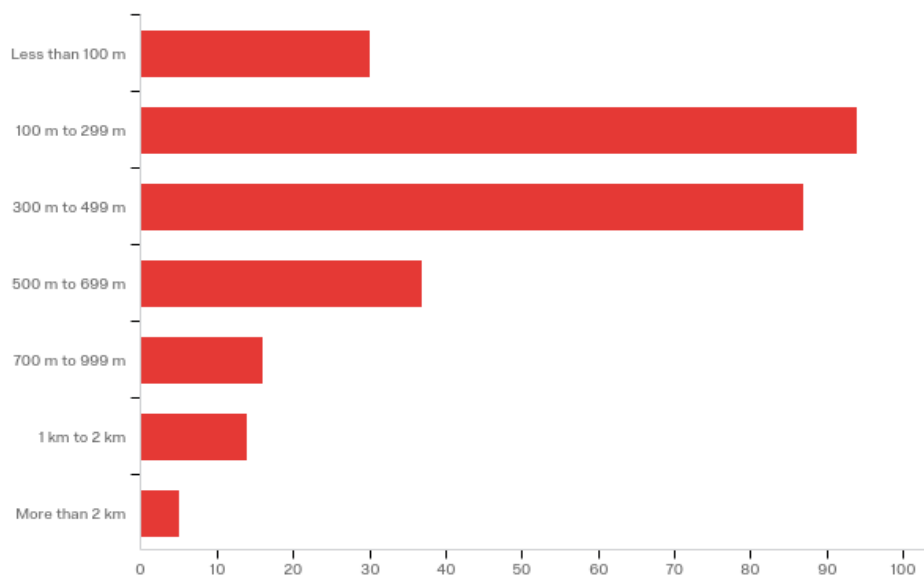
#	Answer	%	Count
1	Yes	30.40%	69
2	Maybe	42.29%	96
3	No	27.31%	62
	Total	100%	227

Car owners:



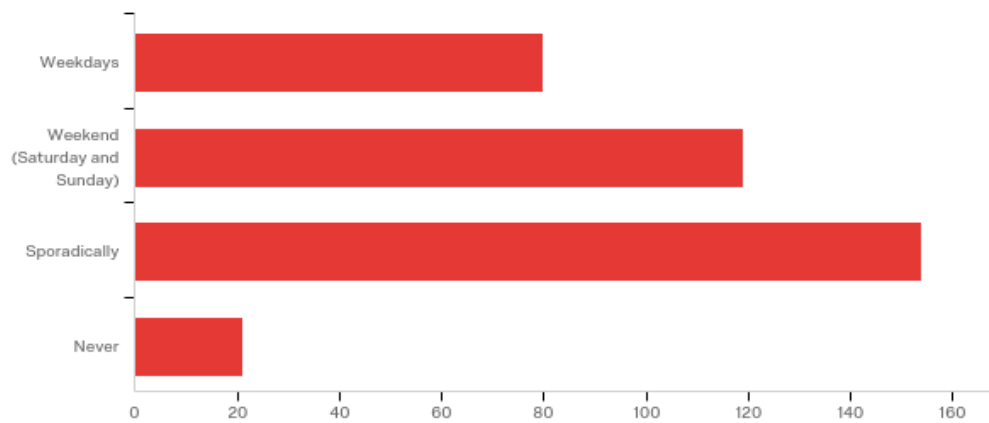
#	Answer	%	Count
1	Yes	25.29%	44
2	Maybe	43.68%	76
3	No	31.03%	54
	Total	100%	174

Q18 - Which distance would you be willing to walk in order to pick up a car provided by a car sharing service?



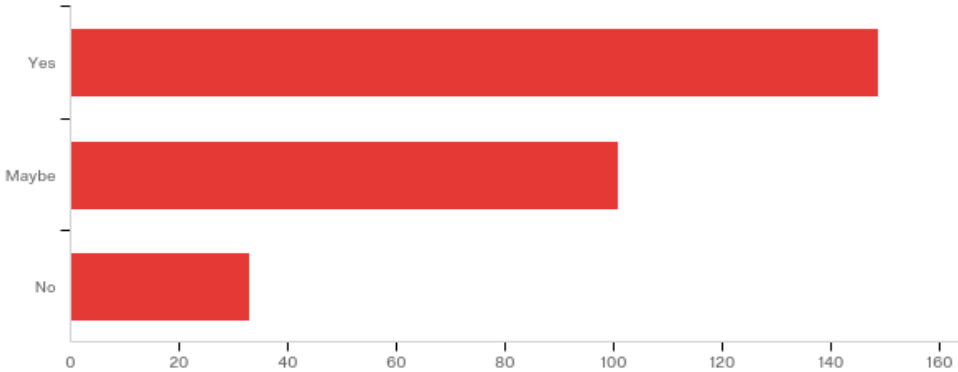
#	Answer	%	Count
1	Less than 100 m	10.60%	30
2	100 m to 299 m	33.22%	94
3	300 m to 499 m	30.74%	87
4	500 m to 699 m	13.07%	37
5	700 m to 999 m	5.65%	16
6	1 km to 2 km	4.95%	14
7	More than 2 km	1.77%	5
	Total	100%	283

Q19 - When would you most likely use a car sharing service? You may choose more than one answer.



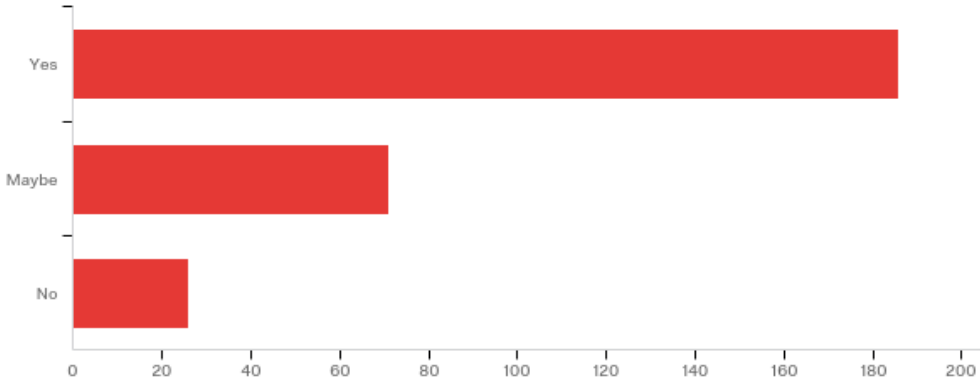
#	Answer	%	Count
1	Weekdays	21.39%	80
2	Weekend (Saturday and Sunday)	31.82%	119
3	Sporadically	41.18%	154
4	Never	5.61%	21
	Total	100%	374

Q20 - Would you be interested in a new mobility network that combines public transportation with car sharing services to offer better connectivity?



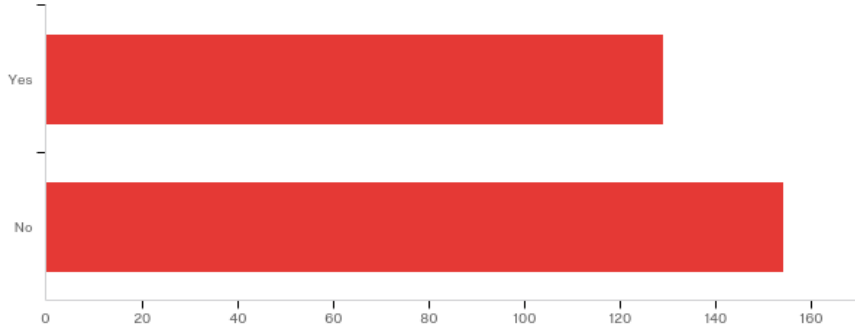
#	Answer	%	Count
1	Yes	52.65%	149
2	Maybe	35.69%	101
3	No	11.66%	33
	Total	100%	283

Q21 - Are you more likely to consider using car sharing services if you have the option to reserve vehicles for specific times and places in advance?



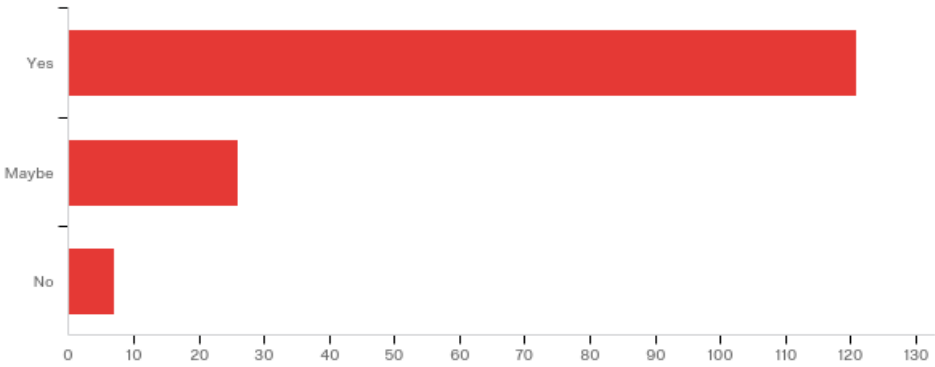
#	Answer	%	Count
1	Yes	65.72%	186
2	Maybe	25.09%	71
3	No	9.19%	26
	Total	100%	283

Q22 - Have you ever driven an electric vehicle?



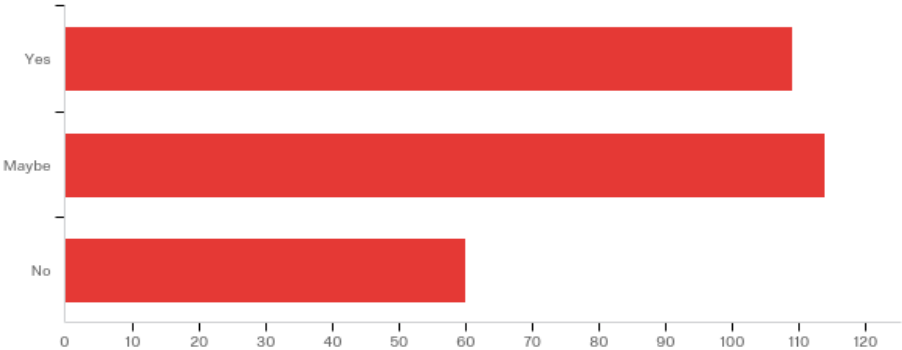
#	Answer	%	Count
1	Yes	45.58%	129
2	No	54.42%	154
	Total	100%	283

Q23 - Would you be interested in driving electric vehicles?



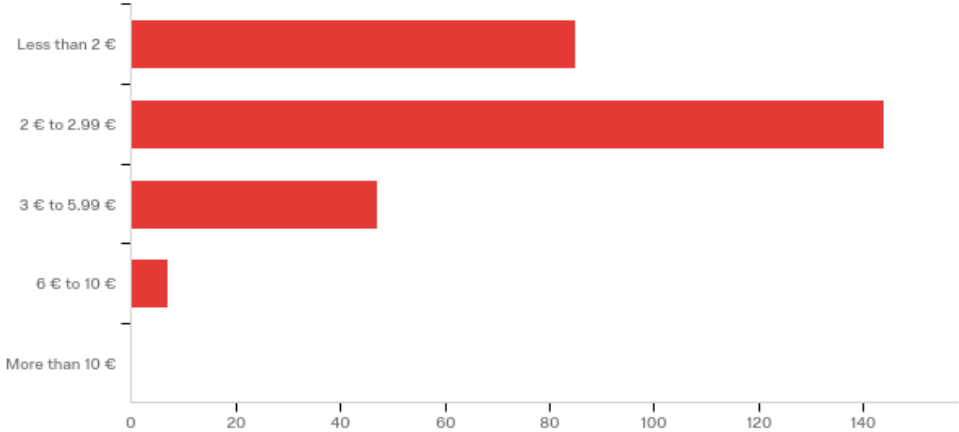
#	Answer	%	Count
1	Yes	78.57%	121
2	Maybe	16.88%	26
3	No	4.55%	7
	Total	100%	154

Q24 - Would you more likely consider to use car sharing if the provider offers a large number of electric vehicles?



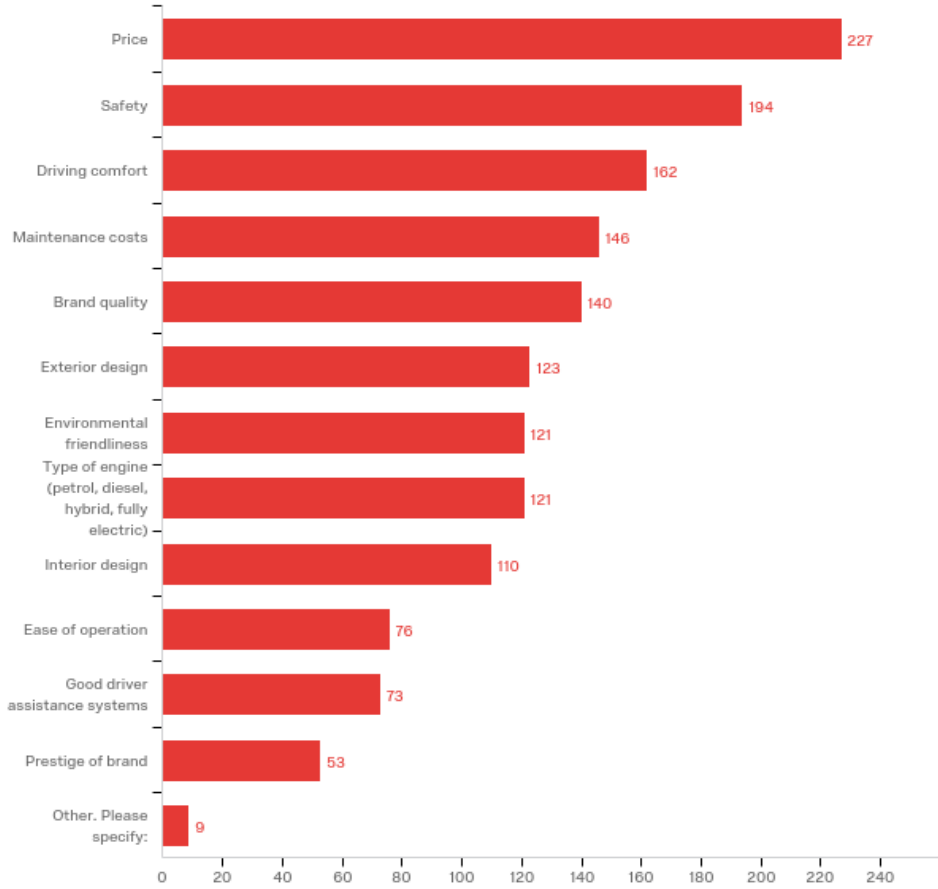
#	Answer	%	Count
1	Yes	38.52%	109
2	Maybe	40.28%	114
3	No	21.20%	60
	Total	100%	283

Q25 - How much are you willing to pay for a car sharing service for a 5 km ride?



#	Answer	%	Count
1	Less than 2 €	30.04%	85
2	2 € to 2.99 €	50.88%	144
3	3 € to 5.99 €	16.61%	47
4	6 € to 10 €	2.47%	7
5	More than 10 €	0.00%	0
	Total	100%	283

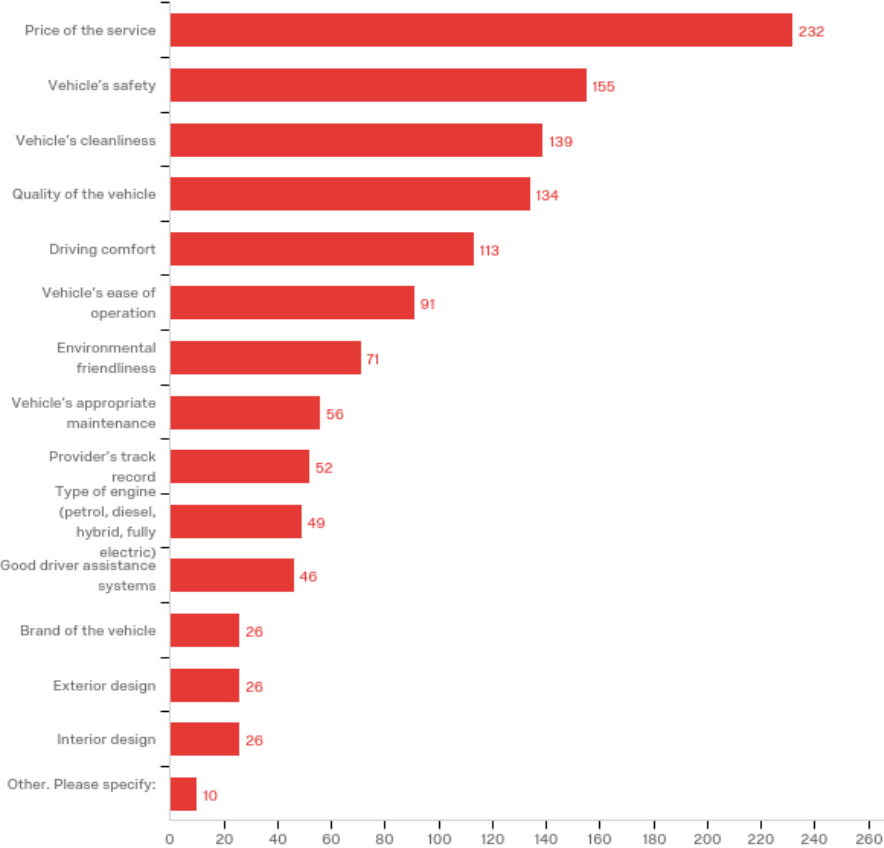
Q26 - When purchasing a car, what are the most important characteristics underlying your decision? You may choose more than one answer.



#	Answer	%	Count
1	Brand quality	9.00%	140
2	Prestige of brand	3.41%	53
3	Price	14.60%	227
4	Environmental friendliness	7.78%	121
5	Safety	12.48%	194
6	Ease of operation	4.89%	76
7	Good driver assistance systems	4.69%	73
8	Exterior design	7.91%	123
9	Interior design	7.07%	110
10	Maintenance costs	9.39%	146
11	Type of engine (petrol, diesel, hybrid, fully electric)	7.78%	121
12	Driving comfort	10.42%	162
13	Other. Please specify:	0.58%	9
	Total	100%	1555

Other reasons: Ergonomics; Horsepower; Reliability; Age of the car

Q27 - When renting a car that you do not own, what are the most important characteristics underlying your decision? You may choose more than one answer.



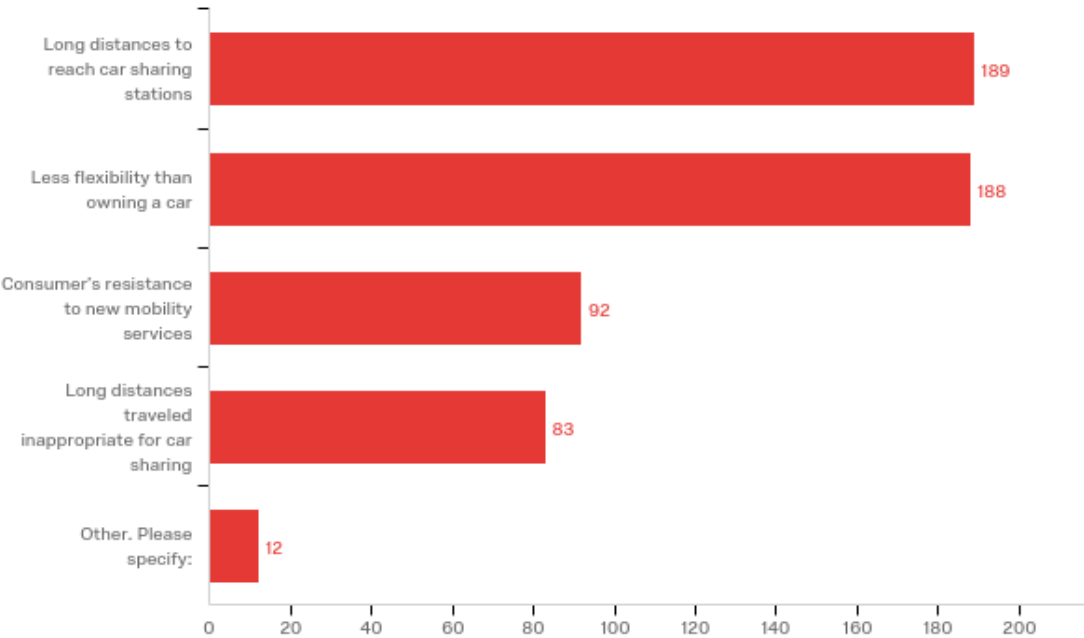
#	Answer	%	Count
1	Price of the service	18.92%	232
2	Quality of the vehicle	10.93%	134
3	Brand of the vehicle	2.12%	26
4	Environmental friendliness	5.79%	71
5	Vehicle's safety	12.64%	155
6	Vehicle's ease of operation	7.42%	91
7	Good driver assistance systems	3.75%	46
8	Exterior design	2.12%	26
9	Interior design	2.12%	26
10	Vehicle's appropriate maintenance	4.57%	56
11	Type of engine (petrol, diesel, hybrid, fully electric)	4.00%	49
12	Driving comfort	9.22%	113
13	Vehicle's cleanliness	11.34%	139
14	Provider's track record	4.24%	52
15	Other. Please specify:	0.82%	10
	Total	100%	1226

Other reasons: Number of seats; Ergonomics; Insurance; T&Cs; Horse Power

Q28 - Please state to what extent you agree with the following statements.

#	Question	Strongly agree		Somewhat agree		Neither agree nor disagree		Somewhat disagree		Strongly disagree		Total
1	Car sharing will reduce the purchase of cars.	19.79%	56	54.42%	154	13.78%	39	10.25%	29	1.77%	5	283
2	Car sharing can expand in rural areas if the car sharing network is well-developed, thus offering high levels of availability/proximity.	22.61%	64	46.64%	132	16.61%	47	10.95%	31	3.18%	9	283
3	Car sharing will play an important role in the next 10 years.	40.64%	115	37.81%	107	14.13%	40	6.01%	17	1.41%	4	283
4	Car sharing attracts customers only if it is inexpensive.	30.39%	86	45.23%	128	16.61%	47	6.36%	18	1.41%	4	283
5	Car sharing is an appropriate solution when short distances are traveled.	27.92%	79	42.05%	119	18.02%	51	10.25%	29	1.77%	5	283
	Car sharing is an appropriate solution when long distances are traveled.	14.13%	40	31.45%	89	26.15%	74	22.97%	65	5.30%	15	283

Q29 - In your opinion, what are the reasons for the absence of car sharing services in low population density areas? You may choose more than one answer.

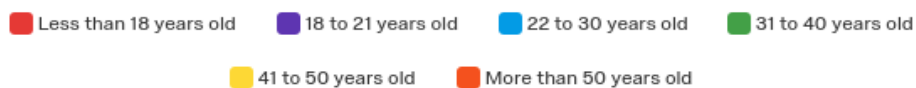
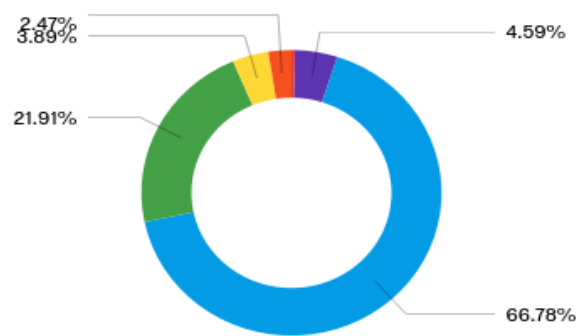


#	Answer	%	Count
1	Long distances to reach car sharing stations	33.51%	189
2	Less flexibility than owning a car	33.33%	188
3	Long distances traveled inappropriate for car sharing	14.72%	83
4	Consumer's resistance to new mobility services	16.31%	92
5	Other. Please specify:	2.13%	12
	Total	100%	564

Other reasons:

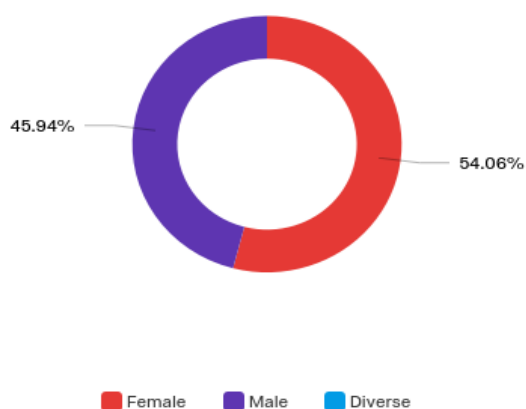
Flexibility and convenience; Lifestyle; Uber and Lyft dominate the market; Availability

Q30 - How old are you?



#	Answer	%	Count
1	Less than 18 years old	0.35%	1
2	18 to 21 years old	4.59%	13
3	22 to 30 years old	66.78%	189
4	31 to 40 years old	21.91%	62
5	41 to 50 years old	3.89%	11
6	More than 50 years old	2.47%	7
	Total	100%	283

Q31 - What is your gender?



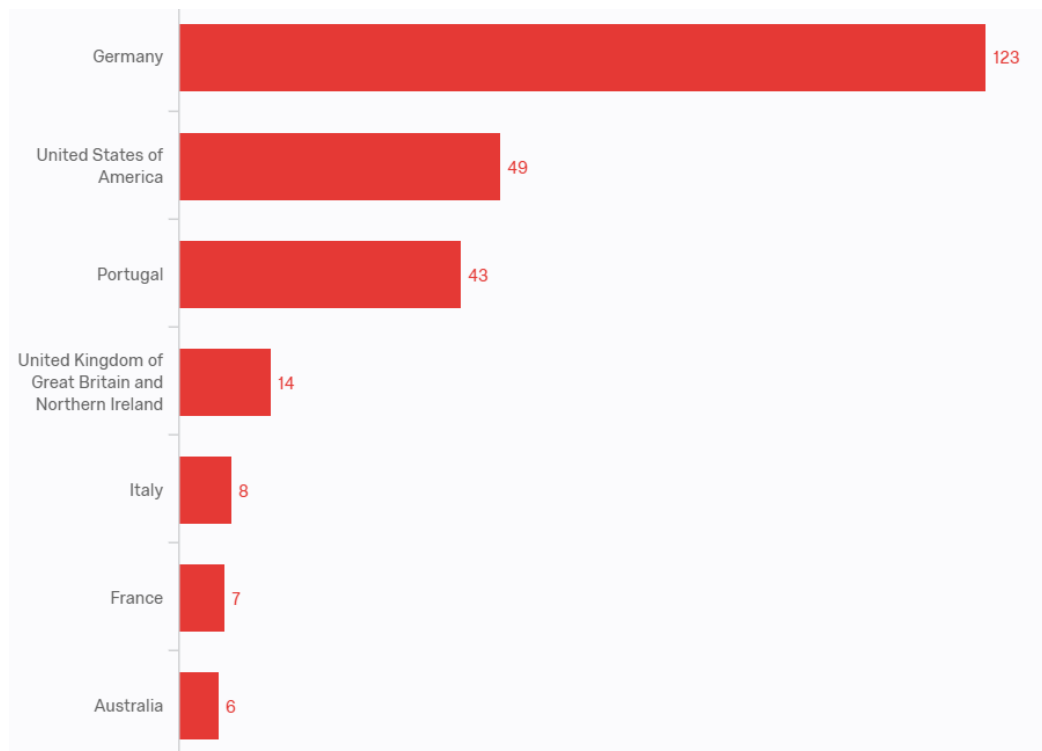
#	Answer	%	Count
1	Female	54.06%	153
2	Male	45.94%	130
3	Diverse	0.00%	0
	Total	100%	283

Q32 - List of Countries

#	Answer	%	Count
1	Australia	2.12%	6
2	Austria	2.12%	6
3	Belgium	0.71%	2
4	Brazil	0.35%	1
5	Canada	0.71%	2
6	China	0.35%	1
7	Czech Republic	0.35%	1
8	France	2.47%	7
9	Germany	43.46%	123
10	Hong Kong (S.A.R.)	0.35%	1
11	Italy	2.83%	8

12	Mexico	0.35%	1
13	Netherlands	1.77%	5
14	Norway	0.35%	1
15	Portugal	15.19%	43
16	Russian Federation	0.35%	1
17	Slovenia	0.35%	1
18	Spain	1.06%	3
19	Sweden	0.35%	1
20	Switzerland	1.06%	3
21	Thailand	0.35%	1
22	Turkey	0.35%	1
23	United Kingdom of Great Britain and Northern Ireland	4.95%	14
24	United States of America	17.31%	49
25	Viet Nam	0.35%	1
	Total	100%	283

Countries with most participants:



Evaluation of relation between car ownership and car sharing registration:

Car owners and non-car owners but shared with family and friends:

#	Field	Choice Count
1	Yes, I am registered and use the service regularly	8.37% 19
2	Yes, I am registered but do not use it regularly	20.70% 47
3	No	70.93% 161
		227

Non-car owners:

#	Field	Choice Count
1	Yes, I am registered and use the service regularly	14.29% 8
2	Yes, I am registered but do not use it regularly	21.43% 12
3	No	64.29% 36
		56

Evaluation of relation between quality of public transportation and car sharing registrations:

Participants residing in city with well or very well served public transportation:

#	Field	Choice Count
1	Yes, I am registered and use the service regularly	13.33% 24
2	Yes, I am registered but do not use it regularly	22.22% 40
3	No	64.44% 116
		180

Participants residing in city with badly or very badly served public transportation:

#	Field	Choice Count
1	Yes, I am registered and use the service regularly	2.86% 2
2	Yes, I am registered but do not use it regularly	17.14% 12
3	No	80.00% 56
		70

Germany: Participants residing in city with well or very well served public transportation:

1	Yes, I am registered and use the service regularly	17.28%	14
2	Yes, I am registered but do not use it regularly	34.57%	28
3	No	48.15%	39
			81

Germany: Participants residing in city with badly or very well badly public transportation:

1	Yes, I am registered and use the service regularly	0.00%	0
2	Yes, I am registered but do not use it regularly	15.38%	4
3	No	84.62%	22
			26

Evaluation of relation between information level and car sharing registration:

Participants who are well or extremely well informed:

1	Yes, I am registered and use the service regularly	27.66%	26
2	Yes, I am registered but do not use it regularly	39.36%	37
3	No	32.98%	31
			94

Participants who are only slightly well informed or not well at all:

1	Yes, I am registered and use the service regularly	0.00%	0
2	Yes, I am registered but do not use it regularly	3.13%	3
3	No	96.88%	93
			96