

# RESEARCH REPORT

## COMMUNITY CAR-SHARING SURVEY AND EVALUATION OF THE AUTO VAN DE STRAAT INITIATIVE

### ENVIRONMENTAL AND TRAFFIC PSYCHOLOGY

REIJKSUNIVERSITEIT GRONINGEN



<https://epgroningen.nl/nl/>



<https://www.smiles-living-lab.nl/>

**Author:** Michelle Lohmeyer

Email: [m.lohmeyer@rug.nl](mailto:m.lohmeyer@rug.nl)

**SMiLES management:** Carina Havenga de Poel & Berfu Ünal

Email: [c.havenga.de.poel@rug.nl](mailto:c.havenga.de.poel@rug.nl); [a.b.unal@rug.nl](mailto:a.b.unal@rug.nl)

**Research Team:** Michelle Lohmeyer; Berfu Ünal; Lena Hölzle; Janet Veldstra; Dick de Waard & Linda Steg

**Date:** 7<sup>th</sup> of June 2024

## PROJECT SUMMARY

In this research, our primary goal was to understand the motivations behind community car-sharing adoption and its integration into daily travel habits. To achieve this, we conducted two studies. The first study involved a survey in the Netherlands, which identified the primary motivators for car-sharing adoption. The second study, following the members of the *Auto van de Straat* initiative, provided insights into people's experiences and use of shared cars.

Our survey showed that people are more interested in car-sharing if they consider it more convenient, safe, and reliable. People also seem to consider using community car-sharing the more they believe it can benefit their local neighbourhood, such as more green space and fewer parked cars. Additionally, signalling social status by portraying an environmentally friendly, tech-savvy, or community-minded image appeared to motivate people to join a community car-sharing initiative.

Furthermore, people are also encouraged to use shared cars sustainably when they believe car-sharing would improve their local neighbourhood and enable them to show who they are to themselves and others.

From the *Auto van de Straat* initiative, we learned that people decide soon after they start car-sharing if they will keep using it. In addition, even if people plan to sell their own car, they do not do it quickly. Furthermore, people seem to stick to their old travel habits: people intended to use shared cars as a substitute for other modes of transport, but when they participated in car sharing, they did not do so as often as they had intended.

Our findings suggest that to encourage car-sharing, it is important to highlight not just cost savings but also the convenience and neighbourhood quality improvements it brings. In fact, financial considerations do not seem to motivate car-sharing in general. Furthermore, setting up a well-organised car-sharing program is crucial, as early experiences greatly influence continued use.

## INTRODUCTION

The transport sector significantly contributes to climate change, producing a large amount of greenhouse gases. Car-sharing is often considered an eco-friendly alternative to using private cars. It helps reduce traffic, air pollution, and the number of parked cars on the streets since privately owned cars remain unused for over 95% of the time. Using shared cars can also significantly lower CO<sub>2</sub> emissions compared to owning private vehicles. However, the benefits of car-sharing depend on the context and whether it is used sustainably. For instance, shared cars might replace more environmentally friendly options such as trains, buses or cycling in cities. In rural areas, car-sharing might add more vehicles to the road network if people do not replace their vehicles with shared cars. In addition, having access to a car, whether shared or owned, can increase the environmental footprint because people tend to drive more. Therefore, it is crucial to investigate how people use shared cars and whether car-sharing is indeed a sustainable alternative to car ownership.

In rural areas, car-sharing initiatives have often failed due to unique challenges. For example, widespread car coverage is challenging because of the large distances between users and cars or the lack of alternatives, such as public transport, to fall back on if a shared car is unavailable. Community car-sharing schemes address some of these barriers.

Community car-sharing involves a fixed group, like neighbours or friends, sharing cars in their neighbourhood. The *Auto van de Straat* (AvdS) initiative is an example of community car-sharing, where up to twenty people share two cars, using an app to manage reservations and payments.

However, what factors motivate people to adopt car-sharing and sustainably use shared cars? To answer this question, we conducted a survey study in the Netherlands and followed the community car-sharing initiative *Auto van de Straat*. We investigated the role of the following types of motivations:



**Instrumental motives:** *Financial* motives such as saving costs, and other instrumental motives such as *convenience, reliability* and *safety*.



**Symbolic motives:** Wanting social status and showing others and oneself that they are eco-friendly or tech-savvy.



**Environmental motives:** Reducing one's ecological footprint.



**Communal motives:** Belonging to a community and strengthening community ties.



**Neighbourhood Quality motives:** Improving one's local neighbourhood environment.

## METHODOLOGY

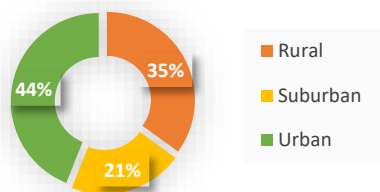
**Survey:** We surveyed 292 individuals in the Netherlands to obtain their opinions on community car-sharing. We showed them a video about community car-sharing and asked them to rate its benefits (i.e., financial, convenience, environmental, communal or neighbourhood benefits). Moreover, we asked them how likely they would be to participate in community car-sharing and how they would integrate the shared cars into their daily travels. People also had the chance to leave a comment at the end of the survey.

In this survey, the average age of the respondents was 52 years, ranging between 21 years and 81 years of age.

Respondents in this survey were on average somewhat higher educated and had a higher income than the average Dutch citizen.

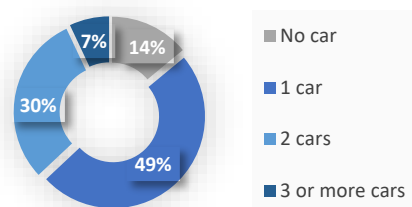
Figure 1 shows the number of respondents who lived in rural, urban, and suburban areas.

Figure 1: Living Area



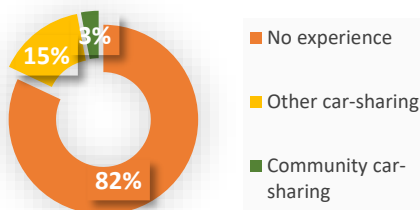
The respondents were representative of the Dutch population regarding their car ownership (KiM, Netherlands Institute for Transport Policy Analysis, 2022) (Figure 2).

Figure 2: Cars per Household



Previous experience with car-sharing is slightly higher than in the general Dutch population (KiM, Netherlands Institute for Transport Policy Analysis, 2015) (Figure 3).

Figure 3: Car share experience



**AvdS initiative:** The AvdS initiative took place in three suburban streets in the Netherlands and extended over the period of nine months. We gathered responses at three different times (Time 1: before the initiative started, Time 2: five months after the start, Time 3: after the initiative ended). Each time, we asked participants to evaluate the benefits of community car-

sharing (same as in the survey) and how they used the shared cars for their daily travels. We had 16 participants who completed at least 2 out of the 3 questionnaires. Our analysis was based on the responses from these 16 participants.

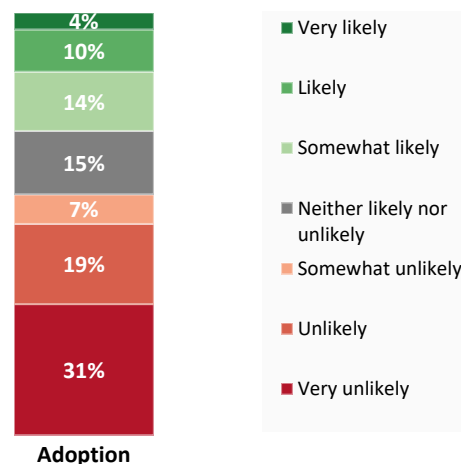
## RESULTS

### Adoption of Community Car-sharing

#### Willingness to Participate (Survey):

Figure 4 shows that, on average, most respondents are not very likely to participate in community car-sharing. However, 15% also seem undecided about whether they want to engage in it.

Figure 4: Willingness to Adopt Community Car-Sharing



### Motivations

#### Motivation to Participate (Survey):

Figure 5 provides an overview of how people evaluated each of the benefits of community car-sharing on average; scores could vary from 1 (low evaluation) to 7 (high evaluation). A high score indicates that people believe the benefit of community car-sharing to be very present. A low score suggests that people believe the benefit of community car-sharing is nonexistent. Most of the benefits (except symbolic benefits) were rated with a score over the midpoint of the scale, indicating that people believe that community car-sharing possesses all the benefits, at least to some extent. Symbolic attributes were rated somewhat lower, indicating that people believe community car-sharing does not provide much opportunity to signal social status but still some.

**Figure 5: Average Evaluation of Community Car-Sharing**

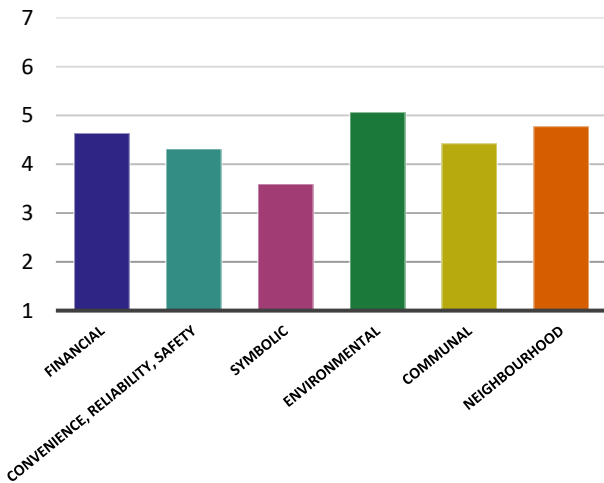
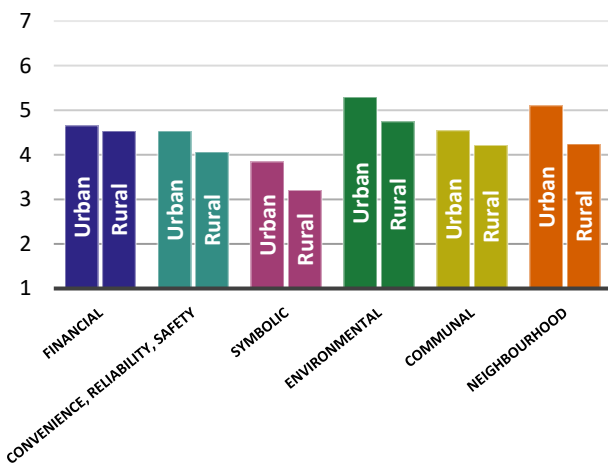


Figure 6 shows that people in rural areas generally rated all benefits of community car-sharing lower than those in urban areas.

**Figure 6: Average Evaluation of Community Car-Sharing in Rural and Urban Areas**



The statistical analysis investigating how important each motivation is in predicting the adoption of community car-sharing suggests that people are more likely to join community car-sharing when they see the practical benefits of car-sharing. Thus, people are primarily interested in community car-sharing if they find it convenient, safe, and reliable. Additionally, individuals are more likely to participate in community car-sharing when they can signal to themselves and others who they are, such as demonstrating social status by promoting an eco-friendly image or displaying technological proficiency. Also, people are more likely to use community car-sharing when they think it would improve the quality of their local neighbourhood, such as few parked cars in their street.

We did not find evidence that environmental motives are related to people's willingness to use community car-sharing. The comments people left in the survey indicate that people are aware of the environmental benefits of car-sharing. Still, other factors seem more important when considering whether to participate in car-sharing. For example, one participant wrote: *'Car sharing conflicts with the main purpose of owning your own car: the freedom to be impulsively mobile. I understand the environmental benefits, but organising car sharing well, scheduling it, negotiating if two need the car at the same time or want to go on holiday, driving damage where the culprit is 'in the graveyard', I see more disadvantages than advantages. [...]'*

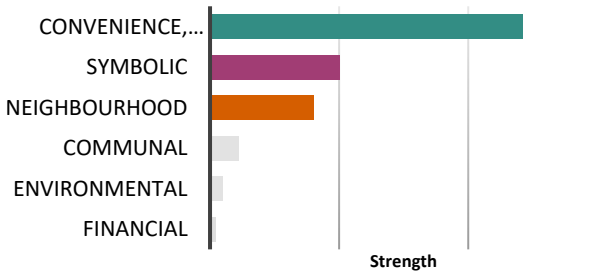
Additionally, financial benefits did not affect the likelihood of using community car-sharing. Similarly, the comments in the survey suggest that even if people recognised that they could save money with community car-sharing, other reasons are more important when considering participating in community car-sharing. For example, one participant wrote: *'Car sharing could be an option, but is not a priority. It can save costs (considerably). Car-sharing requires planning your travels. My own car is always there. My own car is like a home with my own stuff in it. Shared cars are not. My own car is not in my way and is paid for.'*

Furthermore, communal motivations did not predict the likelihood of participating in community car-sharing. In the comments, several people voiced concerns about the community aspect. They do not wish to jeopardise good relationships or are concerned that others will not behave responsibly. For example, one participant wrote: *'In the past, I have shared a car with friends who lived in the same street. That went well, but you had to be careful not to spoil the good relations. Being angry at a company has fewer consequences for personal relationships (in the neighbourhood).'*

Figure 7 shows how important each motive is in predicting the adoption of community car-sharing. Convenience, reliability, and safety are highly important, while symbolic and neighbourhood quality motivations still important but to a lesser extent. Communal, environmental, and financial motivations did not significantly predict people's intention to adopt community car-sharing. When we compared rural and urban residents, the importance of motives changed slightly. Namely, communal motives became a significant predictor of adopting community car-sharing for urban residents but not for rural residents.

All other motives were similarly important for both rural and urban residents.

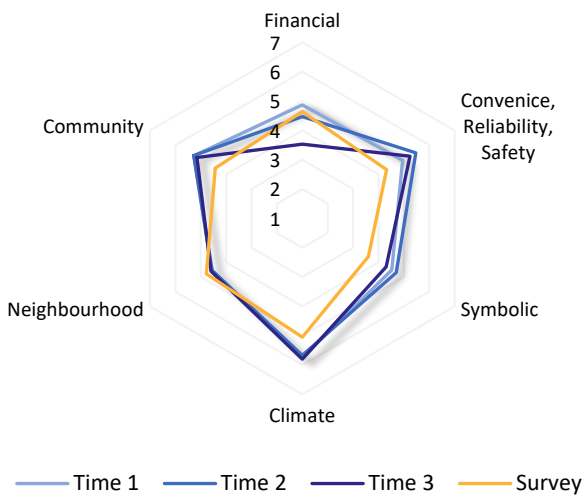
**Figure 7: Importance of Motives to Adopt Community Car-Sharing**



**Motivations Over Time (AvdS):**

Figure 8 shows how people evaluate the benefits of community car-sharing at three different times and the average evaluation score given by the survey participants. The further the line is to the outside (line 7), the higher the evaluation of the benefit of community car-sharing. Over time, people's evaluations of the benefits remained very similar, except that people rated the financial benefits lower each time. Furthermore, survey respondents and participants of the AvdS initiative evaluate all benefits similarly.

**Figure 8: Average Evaluation of Community Car-Sharing Over Time**

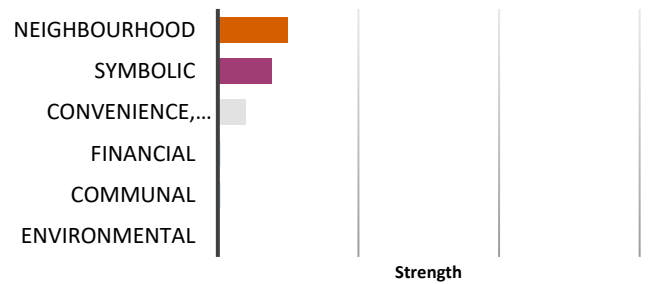


**Sustainable use of Community Car-sharing**

**Motivation for Sustainable Use (Survey):**

The statistical analysis investigating how important each motivation is in predicting the sustainable use of shared cars suggests that people are more likely to use shared cars sustainably when they see the benefits for the local neighbourhood and the benefit of signalling who they are to themselves and others. The other motivations did not predict people's intention to use community car-sharing sustainably. Figure 9 shows how important each motive is in predicting the sustainable use of shared cars.

**Figure 9: Importance of Motives to Use Community Car-Sharing Sustainably**



**Integration of Shared Cars into Daily Travels (Survey):**

We researched whether people would use shared cars for trips they now take by public transportation or bike to see if shared cars are used sustainably in daily life. Figure 10 shows how likely people thought they would replace public transport and cycling trips with a shared car if they joined a car-sharing service. Most people said they would continue using the bike and public transportation almost as much as before. Yet, about 30% of the respondents would use a shared car instead of public transport, and 12% would use a shared car instead of their bicycle.

**Figure 10: Sustainable Use of Alternative Modes of Transport**

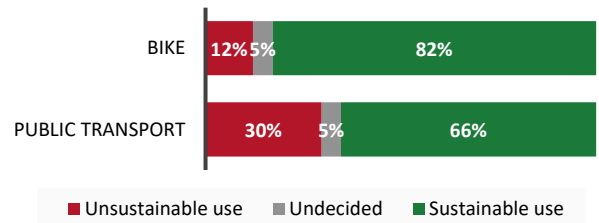
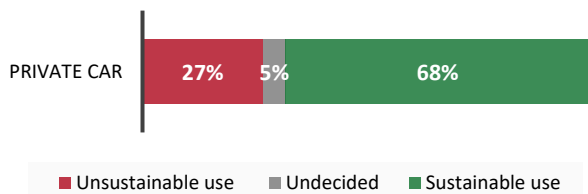




Figure 11 shows that most people would use a shared car for trips they now make with their privately owned cars. Yet, 27% indicate they would still use their private car next to the shared cars.

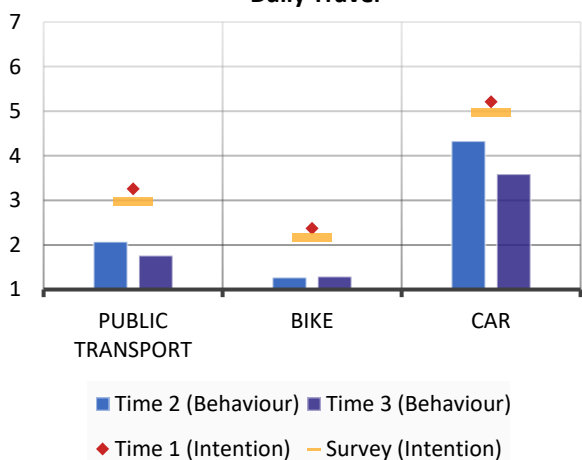
**Figure 11: Sustainable Use of Private Car**



**Integration of Shared Cars in Daily Travels (AvdS):**

The first questionnaire of the AvdS study included a question on how people would use the shared cars. At times 2 and 3, we asked people how they ended up using the shared car in their daily lives. Figure 12 plots people's intentions at time 1 (horizontal lines) and the intentions of the survey participants (diamond) compared to the actual behaviours at times 2 and 3 (bars) of AvdS participants. Overall, it seems that people had higher intentions to use the shared cars to replace other modes of transport than they actually did once they had the shared car available. This means that people are likely to stick to their travel routines and modes of transport they previously used.

**Figure 12: Integration of Shared Cars into Daily Travel**

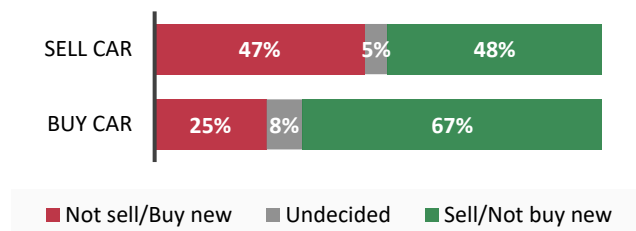


**Car Ownership (Survey):**

Research shows that individuals tend to drive more when they have access to more vehicles, whether shared or owned. Therefore, for car-sharing to be a sustainable option, it would be better if individuals sell at least one of their privately owned cars. Figure 13 shows if people plan to either dispose of or purchase a

new car if they were to participate in community car-sharing. Around half of the people are open to selling their cars if they were part of a community car-sharing initiative. At the same time, about half of the respondents were not interested in selling their private cars. Most people are not thinking about purchasing a new car. However, about a quarter of the respondents would still be open to buying a new car even if they were part of a community car-sharing program.

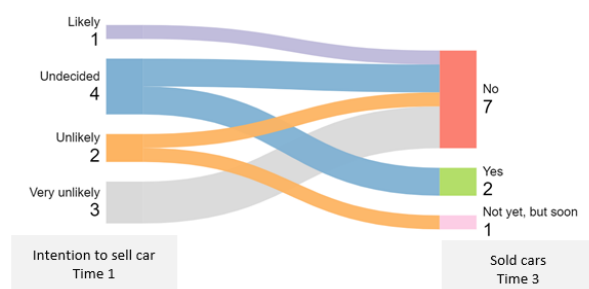
**Figure 13: Car Ownership**



**Car Ownership (AvdS):**

We asked participants of AvdS whether they intended to sell a car during their participation in AvdS. After the initiative ended, we asked again if they had sold a privately owned car. Figure 14 shows people's intentions to sell a private car (left side of the Figure) and whether or not they sold their car or still intended to do so in case they have not sold the car yet (right side of the Figure). Overall, most people are reluctant to sell their cars, as the majority indicated that they had not sold their cars. However, it also seems that the car-sharing experience convinced some people to sell their cars, as those who decided to sell their cars were initially undecided.

**Figure 14: Car Shedding**



**Continuing with Car-sharing (AvdS):**

In the second questionnaire of AvdS, we asked participants if they planned to continue participating in AvdS after the trial period ended. Then, at the end of the trial period, we asked them again if they would continue with AvdS. We found that only those who were at least 80% confident that they would continue at time 2 of the initiative actually continued at the end.

## Limitations

Our study provides important information about community car-sharing, but there are some limitations to consider. Firstly, the number of people who took part in the AvdS research is very small, so any trends in the data should be interpreted with caution.

Although the survey sample is large enough for a robust statistical analysis, it might not fully represent the Dutch population in terms of demographics such as income and education.

Furthermore, the survey study did not assess actual behaviour. The literature suggests an intention-behaviour gap, indicating that although people may have strong intentions, they do not necessarily follow up by engaging in a certain behaviour.

Nevertheless, in the AvdS study, we had the chance to ask people about their actual behaviour. However, the data is based on self-report, meaning that it relies on what people remember about their past actions. People might not remember accurately what they did in the past, thus introducing inaccuracies in the data.

Our findings offer novel insights into the main motivating factors for community car-sharing, which could be used to stimulate people to join such initiatives. Replications of our study with larger samples and by focusing on actual behaviour rather than self-reported behaviour would be useful.

## CONCLUSIONS

Our study on community car-sharing uncovered several key findings.

The primary motivation for people to join community car-sharing is its convenience, reliability and safety. Additionally, people are driven by the desire to show themselves and others who they are, such as environmentally conscious or tech-savvy. Moreover, another important motivation for people to join community car-sharing is its positive impact on the local neighbourhoods by reducing the number of parked cars, thus creating more space for leisure activities and green areas. The opportunity to express one's identity and the benefits of car sharing for the local neighbourhood also drives the sustainable use of community car-sharing.

However, contrary to popular belief, factors like financial savings, environmental benefits, and being

more involved in one's community do not seem to influence people's decision to participate in community car-sharing or use it sustainably. Furthermore, the perceived financial benefits of community car-sharing tend to diminish over time as people continue to use it, while the evaluations of its other benefits remain similar. Although motivations do not vary significantly between rural and urban areas, rural residents generally see fewer benefits in community car-sharing compared to urban residents.

Despite many intending to replace some public transport and bike trips with a shared vehicle, people often do not follow through with using a shared car for these trips but rather stick with their original mode of transport. This is similar to the use of private cars, as people intended to replace private car trips with shared vehicles but did not do so as frequently as initially planned. This suggests that people may struggle to alter their travel habits even after signing up for a shared car initiative.

Car-sharing is more sustainable when people would sell their privately owned cars. Our research indicated that the intention to sell a car was relatively low initially, and most people, indeed, did not sell their cars. However, they did express an intention to sell their car in the future, suggesting that people might need time to transition from private car ownership to shared mobility. Therefore, continuous usage of community car-sharing is crucial. One aspect that motivates people to keep using community car-sharing is positive experiences early on, as individuals typically decide quickly after their first experiences whether they will continue with car-sharing or not.

From the open-ended questions in the survey, we drew another insightful finding. People seem to be uncertain about how community car-sharing functions. Many questions were raised about practical issues such as insurance and maintenance, as well as organisational aspects within the group, including responsibilities and availability. These uncertainties could also act as barriers to people's participation in community car-sharing, so it is critical to remove such obstacles.

## RECOMMENDATION

For community car-sharing initiatives to be successful, they should be carefully set up and run smoothly, as early impressions significantly influence whether



people continue with car-sharing. Moreover, providing clear and comprehensive information on how to use or set up a community car-sharing initiative may be crucial in reducing uncertainties that seem to be a barrier for people to engage in community car-sharing. This is especially important for self-organised schemes, where guidance on insurance, availability organisation, and maintenance responsibilities can help people lower the barrier to forming a community car-sharing initiative. However, pure information campaigns are usually insufficient to promote a behaviour. Information is necessary but not sufficient. Thus, when promoting car-sharing, it is also important to target key motivations that influence people's decision to engage in community car-sharing.

The convenience of community car-sharing, rather than its financial benefits, is the primary motivation for adopting it. Additionally, highlighting the positive impact a car-sharing initiative can have on the quality of the local neighbourhood, such as reducing parked cars on the street, can further motivate participation. Our findings also suggest that people may be motivated by the opportunity to signal their identity through car-sharing. However, caution is advised when emphasising aspects such as benefits for social status, as some literature suggests that explicitly mentioning these benefits might backfire. More research is needed to determine how to effectively operationalise this motivation in advertising car-sharing.

---

## References

- Chapman, D. A., Eyckmans, J., & Van Acker, K. (2020). Does car-sharing reduce car-use? an impact evaluation of car-sharing in Flanders Belgium. *Sustainability* 12 (19): 8155.
- KiM, Netherlands Institute for Transport Policy Analysis. (2022). *The widespread car ownership in the Netherlands*.
- KiM, Netherlands Institute for Transport Policy Analysis & Ministry of Infrastructure and the Environment. (2015). *Car-sharing in the Netherlands*.
- Noppers, E. H., Keizer, K., Bolderdijk, J. W., & Steg, L. (2014). The adoption of sustainable innovations: Driven by symbolic and environmental motives. *Global Environmental Change*, 25, 52-62. <http://doi.org/10.1016/j.gloenvcha.2014.01.012>
- Noppers, E., Keizer, K., Milovanovic, M., & Steg, L. (2019). The role of adoption norms and perceived product attributes in the adoption of Dutch electric vehicles and smart energy systems. *Energy Research & Social Science*, 57, 101237. <https://doi.org/10.1016/j.erss.2019.101237>

## Acknowledgements

This publication is part of the SMiLES project (project number 439.18.459) of the research programme "Duurzame Living Labs phase 2," which is (partly) financed by the Dutch Research Council (NWO).

We also want to sincerely thank our collaborating partners at Natuur en Milieu and the Auto van de Straat campaign partners, Provincie Noord-Holland, MRA elektrisch and MobiGo, for their contributions and support throughout this research.