

Deliverable Proof – Reports resulting from the finalisation of a project task, work package, project stage, project as a whole - EIT-BP2020

<p>Name of KIC project the report results from that contributed to/ resulted in the deliverable</p>	<p>Sustainable Shared Mobility (SuSMo)</p>
<p>Name of report</p>	<p>Co-creation of transition guidance tools on behavioural change report</p>
<p>Summary/brief description of report</p>	<p>A report on the activities from Trivector and the City of Stockholm with objective to research and develop guidance resources in order to improve behavioural change influence in the implementation of car-sharing clubs and other vehicle pools in European cities.</p>
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Supporting Documents: attach in pdf format





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1. Executive Summary

Shared sustainable mobility has the potential to support the transition of the transport system towards decarbonisation. The SuSMo project is developing guidance that will support change agents in making the shift towards shared sustainable mobility. Research identified the following areas for further work:

- Behaviour change - how to make car usage less attractive.
- Collaboration between the private and public sectors.
- Policy regulation and procurement – development of strategic policy platforms.
- Using data to understand the social and environmental impacts.

A challenge encountered is the lack of knowledge of the role behaviour change has in the transition towards transport decarbonisation. This report investigates how car-sharing schemes in Stockholm are perceived by relevant stakeholders and which responsibilities and mandate stakeholders have in the implementation of car-sharing services.

Learnings and recommendations to speed up transition

A good structure, contracts and responsibilities go hand in hand with increased knowledge of effects, benefits of sharing schemes and guidance on how to implement the schemes. Both aspects are needed to create sustainable car sharing systems (and other shared vehicle systems) that are part of and leading the transition towards a carbon neutral future.

Based on the study from Stockholm three major recommendations are given to increase the knowledge of establishing car-sharing schemes.

- A structured method for monitoring and evaluation of car-sharing projects.
- Clear incentives to establish car-sharing schemes within existing housing areas.
- Adopt a strategy for shared mobility.

Recommendations on how to speed up the implementation and use of shared cars and other types of shared vehicles are further described in Chapter 0 *Learnings and recommendations to speed up transition*.

2. Introduction

The SuSMo Project (Sustainable Shared Mobility) aims to catalyse this systemic change by instigating behaviour change, enabling connections and collaborations, and removing barriers through policy change. SuSMo brings together leading European municipalities with experts in the transport sector to provide decision-makers with tools and knowledge to maximise the benefits and mitigate the negative impacts of shared mobility modes. Funded by the Climate KIC (knowledge innovation community) it is catalysing system innovation in three main areas: behaviour change and building capacity, enabling connections and collaborations, and removing barriers through policy change and advocacy.

SuSMo was launched in 2019 and has worked with city representatives and private sector shared mobility providers to establish the key needs and priorities for the effective deployment of sustainable shared mobility.

Research has identified the following areas for further work:

- Behaviour change - how to make car usage less attractive.
- Collaboration between the private and public sectors.
- Policy regulation and procurement – development of strategic policy platforms.
- Using data to understand the social and environmental impacts.

This report investigates attitudes and behaviour at an institutional and policy level among key stakeholders in the car-sharing sector. Car-sharing is one key factor to speed up the transition and to reach climate goals, as people without a private car use other, more sustainable modes to a higher degree. As a basis for the report lies an evaluation of car-sharing schemes in Stockholm, carried out together with the City of Stockholm in autumn 2020 as part of the SuSMo project.

Behavioural change is one of four themes covered by the SuSMo project. Shared electric mobility only supports transport decarbonisation if it is used, and there are important barriers for people to adopt shared mobility for their trips. Overcoming the barriers to individual behavioural change towards shared mobility is therefore of prime importance. The barriers to use shared mobility are also relevant to the relative ease of use of private mobility, thus barriers to behavioural change can also be found at policy level as well as how infrastructure

and pricing supports or impedes the relative attractiveness of different modes. Recommendations are given on how to overcome barriers to increase the supply of shared cars, a prerequisite to increase the use of shared cars instead of privately owned cars. The report focuses on carsharing, but many of the conclusions and recommendations are valid for other types of vehicles as well, i.e. shared bicycles.

2.1 Aim of the report

The report describes key aspects that stakeholders need to work on to create as good preconditions as possible to increase the use of shared cars. The overall aim is to support stakeholders in their decisions to accelerate the implementation of shared sustainable vehicles in the society.

Further, the report connects collaborative aspects between stakeholders with behaviour change theory to increase their understanding, commitment, and ability to implement attractive and useable shared vehicle schemes.

2.2 Methodology

The report is based on existing experiences from car-sharing services in housing areas, and interviews with officials from the City of Stockholm, property owners and car-sharing operators. The interviews have been conducted with the aim to get a deeper understanding on how the car-sharing services work and what challenges that can be found.

Results and analysis of the SuSMo case study in Stockholm have been used to write the conclusions and recommendations for this report.

3. Analytical Framework

3.1 Framework for car-sharing schemes

When establishing car-sharing schemes in connection to properties, there are mainly three phases that are important to have in mind. Dividing the establishment into these three phases makes it easier to create a good understanding of the preconditions that affect the future service.

1. Early planning phase
2. Operational and user phase
3. Monitoring and evaluation of data phase

The preconditions will differ depending on if the services are implemented in new developments or within existing housing areas, the differences are described in coming chapters. In Figure 1 the three phases are described.



Figure 1 Framework for the establishment of car-sharing schemes in connection to housing areas.

3.2 Behaviour change framework

Car-sharing can be seen as a new mode in the transport system, even though car-sharing schemes have existed for more than 20 years and are widely spread over

Europe. The real breakthrough has not come yet, which is clarified by the low market penetration. Only 2 % of the inhabitants in Stockholm claim they have access to (i.e. membership) a shared car.¹

The introduction of “new” modes is comparable to introducing an innovation into a new market. With that in mind, the theory of diffusion of innovations² can be used to describe the dissemination and evolution of the mode on the market. The four elements that influence the dissemination of a new idea are:

- The innovation itself
- Communication channels
- Time
- A social system

An innovation must be widely adopted in order to self-sustain, which means that it relies heavily on the acceptance and trust of individuals. Different groups of consumers adopt new ideas at different pace, dividing the groups in innovators, early adopters, early majority, late majority and laggards, see Figure 2.

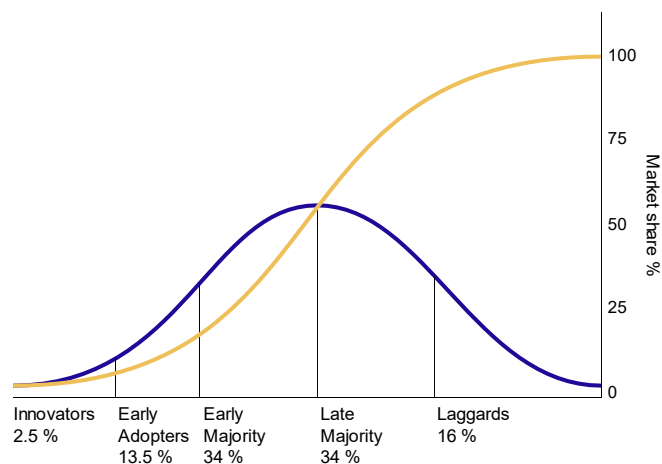


Figure 2. The diffusion of innovations according to Rogers. With successive groups of consumers adopting the new technology (shown in blue), its market share (yellow) will eventually reach the saturation level. The blue curve is broken into sections of adopters. Source of image: Wikipedia.

According to general behaviour change theory, an individual goes through five phases when adopting a new idea or a new habit:

¹ Medborgarenkäten miljö och miljövanor i Stockholm 2016, Miljöförvaltningen, <http://miljobarometern.stockholm.se/trafik/resvanor/>

² Rogers, E, 2003 Diffusion of innovation, 5 th edition

- Knowledge
- Conviction
- Decision
- Implementation
- Confirmation

The five phases are present to some extent in all types of target groups and stakeholders: users, mobility providers and authorities.

3.3 Analysis of the car-sharing market

The survey carried out in Stockholm shows that the biggest barriers for car-sharing schemes to be successful and evolve on the “diffusion of innovations-ladder”, have been communication, time and the social system. Starting with the *social system*, it has in many reports been established that the existing society has been built for the privately-owned car. This is obvious when looking at street layout in urban and suburban areas but is also prominent in urban planning and traffic policies and tax regulations which all favour owning a car. The social norm of owning a car has grown strong based on these policies. Regarding *time*, during the 20 years of existence of car-sharing schemes there have been a few disruptive moments that could have favoured a deeper market penetration, above all the economic crisis in the end of the 00s. This report does not analyse why, but there are hints that now is a good time (climate is higher on the agenda, digitalisation is more mature). It is also clear that the *communication* around car-sharing can be much improved by all involved stakeholders, especially regarding the division of responsibilities in communications issues.

4. Car Sharing Projects in Stockholm

During the autumn 2020 an evaluation of existing car-sharing schemes was carried out as part of a case study within SuSMO. The aim was to map the existing schemes and evaluate how key stakeholders experience the development of the services.

4.1 Car-sharing schemes in housing areas

An important part of the study has been to map existing station-based car-sharing services within City of Stockholm. The mapping has particularly been focusing on station-based car-sharing schemes located within or in close relation to buildings.

This is the first mapping of this kind since City of Stockholm introduces the green parking permits in 2015 (*Read more about the Green parking permits in text box 1*). This incentive was introduced by the City to stimulate lower parking rates and shared mobility in new developments, with the aim of reducing private car-ownership.

Text box 1. Stockholm Green parking permit system

The objective of the Green parking permits is to reduce the amount of space that cars occupy in Stockholm. By reducing the demand for private parking places, this helps to encourage alternative forms of transport. The aim is to:

- Reduce parking spaces.
- Provide access to alternative modes of transport.
- Reduce the cost of construction / purchase by reduced internal parking.
- Provide urban space and increase local quality of life by reducing external parking

The index was developed by an inter-departmental team. The key is a building regulation that starts with a baseline for parking spaces. This is based on current car ownership per apartment in the city. The rate is then adjusted by a percentage depending on what mobility services that are implemented and the amount of parking that the municipality demands for the new development. In addition to the actual car-sharing schemes an important prerequisite for mobility services is to regulate street parking, either by pricing or by timing regulations. This is needed to provide an incentive that will stimulate behavioural change.

10% adjustment – on the provision of:

- Information package.
- High quality bicycle parking with easily accessible facilities such as automatic doors.
- Access to car-sharing.

15% adjustment – on the provision (in addition to the above):

- Bicycle sharing schemes.
- Free trial access to public transport.

25% adjustment – on the provision of (in addition to all the above):

- Service boxes (some with cooling facilities) for the storage of home deliveries

Source: City of Stockholm, Smart Impact <https://smartimpact-project.eu/case-studies/generic-case-study/>

The mapping of the car-sharing schemes has been studied on three types of car-sharing services in property projects.

1. **Car-sharing service established within the Green parking permit system.** This includes car-sharing services established within new development projects within the Green parking permit system.
2. **Car-sharing services established in property buildings in collaboration with property owners.** This includes car-sharing services established in properties based on organic collaboration between a property owner and a car-sharing operator.
3. **Car-sharing on public parking spaces located in new development projects.** This includes car-sharing on public street parking established in Stockholm flagship development projects Hammarby Sjöstad and Norra Djurgårdsstaden.

The mapping of car-sharing services connected to buildings indicates approximately 120 car-sharing vehicles in total. This could be seen in relation to the total number of station-based car-sharing vehicles which is estimated to approximately 570.

4.2 Evaluation of car-sharing services in property development projects

The study of the car-sharing project is based on interviews with the property developer, owners, and car-sharing operators. In the following chapter we will present findings and results from the study seen from the different phases and highlight key perspective seen from different stakeholders involved in the process of establishing the car-sharing sites. This includes city administration, developers, property owners and car-sharing operators.

Early planning phase

Green parking permits: policy in Stockholm

The evaluation including property development projects and car-sharing operators indicates that the green parking rates has been a clear incentive for developers to include car-sharing in new development projects. Since the launch in 2015 the policy has generated car-sharing services in several new development projects. However, several concerns and challenges have also been raised in relation to early planning, more of that in the following sub-chapters.

Cooperation with developers and car-sharing operators

A key learning from this phase in establishing a car-sharing service is the importance of collaboration between the property developer and the car-sharing operator already in the construction phase. It is important to address and inform residents through on-boarding campaigns. In some projects the interest or ambition from the developer has been low which also affects the impact and knowledge among potential users. An early collaboration gives the stakeholders a good opportunity to profiling the project from a sustainability mobility perspective and good possibilities to communicate the benefits of car-sharing.

The risks of not involving a car-sharing operator in this phase is a missed opportunity to inform and to engage the new inhabitants to change behaviour. Moving to a new home is a key moment and opportunity to change habits, for example to go from private car to a car-sharing service. The evaluation in Stockholm indicates that projects where the car-sharing services is established late, when people have already moved in, have a much lower degree of use of the shared cars.

Partnership agreements: risks and possibilities

The evaluation indicates that there are both benefits and challenges when signing partnership agreements on car-sharing services in a very early stage, e.g. already during the building permit process. Long planning horizons make it difficult for property developers to handle changing needs within a project when an agreement has already been written. In this context property developers experience that they are locked into agreements with specific mobility service providers and cannot change to accommodate other needs. On the other hand, it is important to involve the car-sharing operator in an early stage of the project, in order to secure the on-boarding and information to residents. It then becomes important for the property developers that the agreement can be developed over time to better meet the needs of the residents.

Considering these challenges, it is important to find solid and flexible partnership agreements that serve the interest and benefits of both the developer and the car-sharing operator, and at the same time meet the requirements from the City.

Challenging to develop car-sharing services within existing building stock

The car-sharing operators have raised the challenge of establishing new stations within existing building stock. Currently there are strong traditions and norms supporting private owned cars in these areas, in many cases there are also favourable parking conditions. The green parking permit policy is designed as an incentive to support car-sharing in new developments but there are no specific incentives the policy to develop car-sharing within existing building stock. However, the City of Stockholm have other policy measure in place for supporting shared mobility in general, for example the parking management plan, which stipulate high parking fees and restricted street parking.

Still, there is a potential to explore other types of policy measure to support an acceleration of shared mobility solutions in already built areas. Since the majority of the inhabitants live in existing building stock there is a large potential to stimulate a transition from car-ownership to shared mobility services. These areas are also the most challenging areas for creating a behavioural change and thus it is essential to find new policy tools designed to increase the use of shared mobility also in these areas.

Operational and user phase

Cooperation between property owners and the car-sharing operator

When the car-sharing service is in operation, the collaboration with between the operator and the property owners is a key aspect. Often it is a tenant-owner association-, municipal- or private property owner who takes over responsibility after the property developer and new ways of cooperation with the car-sharing operator must be established.

The interviews indicate that there are some challenges with the communication strategy to potential customers within the property. Both parties address a need of new ways of reaching out and attracting new customers within a property. The division of responsibilities is also unclear since both parties consider that they "own" the costumers (the residents). The risk is that communication then will become inefficient. Currently, both property owners and car-sharing operators are developing new tools for communicating with customers. One solution that now is tested is using digital platforms for tenant information.

More cooperation with other mobility service providers and together with the mobility hub development

A key finding from the study is that the cooperation between car-sharing operators and other mobility service providers could further develop. Integrated planning of car-sharing and mobility services through mobility hubs could further enhance a complete offer on sustainable mobility and reduce the need of privately owned cars.

Conflicting business models, open vs closed car-sharing solutions

Most car-sharing operators prefer open car-sharing solutions for all their stations (i.e. open to users independently if they live in the a particular property or not). This solution has many benefits for managing a fleet of shared vehicles and to get a high usage in general. However, potential conflicts of interest may arise in property projects between the property owner and the car-sharing operator. The reason is that property owners often pay a fixed fee for the car-sharing service, e.g. five years access for a certain number of shared cars connected to the property, and if the service is open to any costumer the property owner may find that they are paying for a service that is not (exclusively) used by the residents.

In some projects there have also been problems when the car-sharing service is less used than expected by the residents in the property, that leads to problem for the operator since there business model rely on both fixed and variable incomes.

Monitoring and evaluation of data

Framework for evaluating car-sharing services in property development projects

There seem to be shortcomings in routines around how to follow-up the establishment and use of car-sharing services connected to buildings. The City of Stockholm is currently developing a framework for evaluating sustainability aspects in the land allocation process, including follow-up indicators on car-sharing services and green parking permits. This will hopefully support the city administration in monitoring the development of car-sharing and further develop a framework for data requirements.

Conflict with GDPR and business secrets

There are also challenges from a data protection perspective. Normally, the car-operator sign an agreement with a customer and the property developer or owner does not have access to customer information. Since most car-sharing services are open to any customer and can be used by anyone and not just residents within properties, the property owner sometimes has difficulties to know if it is their tenants that use the service or if the users are other people from the neighbourhood. This affects the communication with the residents.

However, in cases where property developers have an agreement with an operator who establishing a closed car-sharing service it is easier to follow up. In this case, the property developer can receive data and statistics of how the car-sharing service is used on regular basis from the supplier.

4.3 Lessons learned

Based on the case study several key learnings have been identified for each phase. This could serve as a base for other cities and private actors to learn how to better develop a good model for public-private collaborations in establishing car-sharing schemes. Thus, the lessons could support both cities, developers and operators to find good governance models to increase accessibility of shared vehicles in property developments.

Early planning phase

- **The City administration can further support and clarify the roles of the developer and car-sharing operator in the early planning phase.** This could for example be clarified in the guidelines for the green parking permits.
- **The City administration could develop and set-up a clearer framework for evaluating car-sharing services.** This could be specified within the green parking permit guidelines but should also be developed in close dialogue with the developers and car-sharing operators. To develop the framework the city needs to develop a set of indicators to monitor the use and development of car-sharing in property projects.
- **City administration, developers and car-sharing operators needs to develop better partnership agreements.** In order to find a solid base for the collaboration between the stakeholders there is a need for developing more clear forms of partnership agreements. This could help all stakeholders defining and clarifying their role and responsibilities in

operational phase as well as securing long-term relationships among the involved stakeholders.

- **Develop the collaboration forms between developers and car-sharing operators as well as developing common communication tools.** A key for a successful car-sharing within a property is to communicate in early phase to the new residents already during construction phase. In this phase the developer and car-sharing operator needs to develop more integrated platforms for communicating with future residents. Important activities is also to conduct on-boarding campaigns in order to profile the project from a sustainable mobility perspective and to inform about the possibilities to use shared vehicles.

Operational and user phase

- **City administration could act more as a facilitator and coordinate mobility services across larger developments areas and specific development projects.** There is a need to better coordinate the supply of car-sharing services together with other mobility services. This is particularly important in larger urban development projects to be able to find synergies between shared mobility services and to find more efficient solutions across different property developments projects.
- **Clarify roles of responsibility when a property is transferred to a new owner.** In the operational phase the property owner has a key role and there is a need to further develop and clarify how property owners and car-sharing operators could work together.
- **Property owners and car-sharing operators should find common tools for communicating to existing and potential customers.** Currently some projects have a challenge to define which stakeholder who “own” the right to communication to potential customers within a specific property. The property owner and car-sharing operator could develop better tools for communication to increase the use of the car-sharing services. In this context several of the property developers are looking for digital platforms for communicating to potential new customers.

Monitoring and evaluation of data

- **The City administration needs to develop clearer requirements to mobility service providers on data delivery of the use of car-sharing**

services. In order to find a more structured approach of evaluating the use and development of car-sharing service, the city could develop clearer guidelines and requirements on what data the shared mobility provider should deliver to the city. Currently, there are no requirements or guidelines on data gathering and there is a potential to develop an indicator framework for monitoring the development.

- **Challenges related to data protection and business secrecy needs to be further investigated.** Currently there are several uncertainties regarding data protection issues in relation to monitoring the use of services in property projects. This needs to be further investigated in order find the suitable way of collecting information about car-sharing usage. Also, in relation to this, data is seen as a business secret among car-sharing operators. In this context, it is important to find a framework of indicators that takes into account both private data protection issues and business secrets.

5. Learnings and recommendations to speed up transition

A good structure, contracts and responsibilities go hand in hand with increased knowledge of effects, benefits of sharing schemes and guidance on how to implement the schemes. Both aspects are needed to create sustainable car sharing systems (and other shared vehicle systems) that are part of and leading the transition towards a carbon neutral future.

5.1 Recommendations on structure and strategy

Based on the study from Stockholm three major recommendations are given to increase the knowledge of establishing car-sharing schemes:

A structured method for monitoring and evaluation of car-sharing projects.

Without a regular monitoring of the extent of established car-sharing- or other vehicle services and how they are used, knowledge will never increase. The City administration should be responsible for developing a clear structure, which also will form the basis of which data the property owners and operators are required to share. With increased knowledge the agreements and requirements will be increasingly better.

Clear incentives to establish car-sharing schemes within existing housing areas.

The biggest potential to reach a transition towards lower car ownership is by making it easier for car-sharing, bike-sharing and other shared vehicles operators to establish in existing housing areas. The City administration need to govern and incentivise, but always in cooperation with other relevant stakeholders. Clear driving forces need to be identified in order to create change.

Adopt a strategy for shared mobility.

It is recommended to, within the sustainable urban mobility plan or similar policy document, include a section of how shared mobility should be dealt with in the city and how shared mobility can help to accelerate the transition towards the climate goals.

5.2 Recommendations on attitudes and behaviour

A large part of facilitating change deals with attitudes and behaviour. Both to increase awareness and collaboration between stakeholders and also to reach

potential users. Based on the study in Stockholm and earlier experiences, the following recommendations are given on how to change attitudes and behaviour towards a higher use of shared sustainable vehicles.

- Increase **knowledge** of shared vehicle schemes.
 - Property developers and owners need to improve their knowledge of the operation of shared services and of user needs.
 - City officials need a better knowledge on how services work and under what circumstances. Mapping existing schemes and developing a structure for monitoring is a good start.
 - Operators need to share more of their information to partner stakeholders.

Increased knowledge is the first step to all changes and will open for success in further steps.

- Increase the **commitment and conviction** of creating good, long-lasting schemes.
 - The City administration should in collaborations with operators and developers form frameworks and agreements on how to deal with shared vehicle systems. Frameworks will form the basis for long-term services.
 - Awareness raising among decision makers is needed to underline the importance of shared sustainable mobility and to later on facilitate implementation of shared vehicle schemes.
 - The City administration should establish a framework for monitoring shared services over a larger area. This is important to get an even distribution over an area so the services will be easily accessible for all.
 - A recommendation to the City administration is to form and launch incentives programmes for involved stakeholders as a way to increase commitment.
- Facilitate **decisions**.
 - Early in the planning process it is advisable to be clear on roles and responsibilities. A recommendation is that the City administration develops a suggestion on which stakeholder is responsible for what and when. The suggestion should be agreed on for each project or establishment.
 - Communication is one particular role to clarify. Property developers, owners and operators need to agree on the best communication strategy with the aim to get as many users as possible.
- Facilitate **implementation** of shared services.

- Frameworks, agreements and incentives programmes should all contribute to the implementation of the services. – communication strategies, incentives programmes for users.
- Confirmation of the success of a shared vehicle service.
 - Feedback of the success of a scheme is a vital ingredient in maintain a behaviour and a commitment. Regular meetings following up the progress of service should be set up.
 - All stakeholders should be invited to regularly discuss and up-date the existing frameworks, agreements and requirements based on new findings, experiences and knowledge.

A behaviour change framework for **potential users** should be set up with the following elements:

- Awareness raising of the benefits of using shared sustainable mobility.
- Advice and support for on-boarding and how to use a vehicle or digital platform.
- Development of incentives programmes making it attractive to use a shared vehicle.
- Regular feedback on inhabitants use, gains and comparison to their neighbours or other relevant groups.