

# SUSTAINABLE MOBILITY OPTION: SETTING THE STAGE FOR CAR SHARING

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**Abstract.** *Shared transport has shown strong growth in recent years as growing environmental, energy and economic concerns have intensified the need for sustainable alternatives [1]. Implementation of car sharing, as one type of shared transport, is rapidly widening, not just in developed urban areas. Considering the potential that car sharing has in the reduction of the burden on transport and the environment, contributing to their sustainability, this paper proposes a scheme for the introduction of this option in bigger urban areas in Macedonia.*

**Key Words:** *Car sharing, Sustainability, Urban transport*

## 1. INTRODUCTION

There are many reasons for the rise of all types of shared transport, among which car sharing: environmental pollution, increased awareness of climate change, scarcity of space and resources, financial reasons, public awareness [1].

Car sharing can be considered as a part of urban mobility ecosystem, resulting from the search of sustainable modes for organization and limitation of car usage. Although for car sharing as a sustainable activity is not very common to be met in every urban area, still it is a fast growing and fast changing [2], not just in developed countries. Hence, it gives every appearance of working and doing a useful service for individuals, groups and neighborhoods who have decided to try it [2].

This paper has aimed at discussing what are the principles, potential and benefits for a breakthrough of car sharing in urban areas in Macedonia, considering the current level of sustainable urban transport modes. Therefore, for the purposes of supporting the introduction and implementation processes of car sharing, a complete scheme is presented and elaborated.

## 2. PRINCIPLES AND PRACTICE OF CAR SHARING

Car sharing becomes an economically attractive alternative for people who live in built-up areas, who do not necessarily need a car every day (having other ways of meeting most of their daily access requirements, including public transport, walking, biking, or even using technology as videoconferencing, telework, et al), and who normally drive their cars less than some minimum number of kilometers in the year [2].

Car sharing enhances mobility possibilities and provides people with access to a car which they otherwise would not have had [3].

The concept of the car sharing is that members share cars owned by an organization or company, by paying an annual fee, as well as paying for each kilometer travelled and the time per use [3]. Hence, car sharing offers to its members many of the advantages of car use, while at the same time getting rid of the costs of car ownership.

The general idea of car sharing is “pay-as-you-drive” which leads to more optimized car usage. Car sharing fleets are usually organized by a private company or association subsidized by a local or national government or public transport authority, and is generally offered to the public and sometimes also to business customers [1].



Figure 1. Classic round-trip car sharing mode [4]

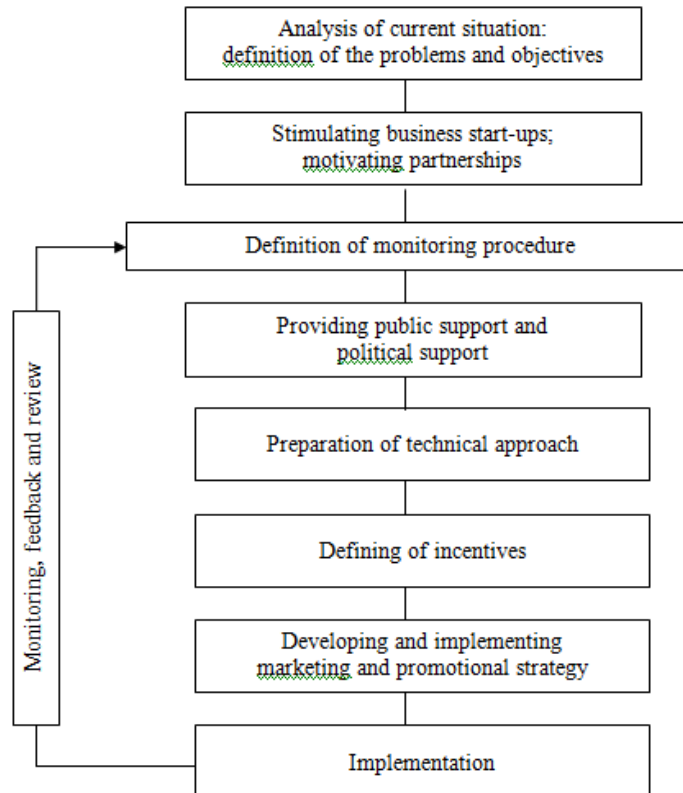
Studies have shown that car share members use car one third less than car owners and that a shared car substitutes 5-15 owned cars. With fast progress of intelligent mobility services connecting cars with users (e.g., new smart phone apps for both reserving, paying and tracking of shared cars), car sharing might escalate as a significant alternative to private car use in the years to come [3]. Only when car sharing actually contributes in reducing car use, it deserves the notion of a “sustainable mobility” solution [3].

### 3. INTRODUCING CAR SHARING IN THE MACEDONIAN TOWNS

Urban transport in Macedonian town is characterized with insufficiently developed sustainable modes of transport: public transport, biking and walking. Their future development will incite the possibility of implementation and continuance of car sharing. Hence, the analysis presented next is a good support for the start of this sustainable mobility option, when conditions would allowed.

#### 3.1. Components of the scheme for planning and introduction of car sharing

There is a wide range of car sharing schemes operating in a variety of contexts, and no one of them provides an ideal template for all situations. Still, implementation of the following scheme can support the successful introduction and realization of car sharing.



*Figure 2: Scheme for approach to car sharing*

Source: made by the authors, according to [5]

The structure of every component of the scheme is elaborated next.

**1. Analysis of current situation: definition of the problems and objectives:**

- analysis of current situation [2]:
  - size of target area and of target group to be served
  - organization of offered services in urban transport, level and quality of service, prices and payment
  - number, types and condition of urban vehicle fleet
  - technological sophistication (of the vehicles, supporting information system, operational infrastructure, etc.)
  - links with other parts of the region's transport system
  - degrees of local support, including local government
- definition of the problems:
  - shortage of car parking
  - congestion
  - limited alternatives to travelling by car
- definition of objectives (basic):
  - environmental benefits
  - improvements in congestion and parking
  - improvement of public service in general.

**2. Stimulating business start-ups; motivating partnerships:** The organization introducing car sharing has a clear understanding of the business case for promoting car sharing. Partnerships between all involved parties should be strongly motivated and supported, in order for efficacious commitment to car sharing [5]. Involved parties usually are organization(s) introducing car sharing, the local authority and, if appropriate, the software provider (for example, smart phone app).

**3. Definition of monitoring procedure:** Appropriate is Business Activity Monitoring (BAM), to proactively define and analyze critical opportunities and risks in the business scheme, in order to optimize efficiency and maximize profitability. Additionally, changes in transport and environment should also be monitored.

**4. Providing public support and political support:** Without these kinds of support, the scheme will be a failure. Introduction of the scheme should be widely accepted by the inhabitants, by understanding that car sharing contributes for resolving serious problems in transport and environment. Policy support for car sharing schemes might be directly economically for investments, and indirectly by permitting access to urban zones and prioritizing parking for shared vehicles [3].

**5. Preparation of technical approach:** Preparation before launching the car sharing is both thorough and robust [5]. Workable, realistic and cost-effective technical and administrative approaches are necessary. Consultations with local authorities and urban/transport planners should be carried out at an early stage, so that any issues raised could be addressed. In terms of a budget, there should be sufficient resources available for the development, implementation and maintenance of the scheme [5]. Finally, communicative measures are also crucial for further development, i.e.

mediation and dissemination of knowledge and information as well as political and organizational networking and alliances [3].

6. **Defining of incentives:** Incentives and supporting measures should be provided [5], which aim to address objections and deterrents to car sharing (priority parking spaces, rewards, special tariffs or tickets for car sharing to achieve a seamless transfer between sustainable transport modes etc.).
7. **Developing and implementing marketing and promotional strategy:** An effective direct marketing campaign should be sustained, as well as effective promotion, which will provide car sharing with a good image both for the individual car sharing members and the companies using shared cars. This strategy will raise awareness of car sharing, highlighting the advantages of the scheme to users (savings on time and resources, free parking and possible discounts on other amenities such as museum, theatre and cinema).
8. **Implementation:** Feasibility of the final step of the scheme depends of the quality of realization of all the previous components.

### 3.2. Benefits for users and for society

If implemented to properly function, car sharing can achieve many benefits (table 1). It can complement existing mass transit options, reduce the overall number of vehicles on the road, and ultimately improve mobility in densely-populated urban areas. Working in tandem with other mobility options like public transport, bike share and walking, car sharing is making urban mobility much more efficient while also reducing air pollution [6].

*Table 1: Benefits of car sharing for users and society [5]*

Benefits for users	Benefits for society
<ul style="list-style-type: none"> <li>- ownership cost savings through reduced car use</li> <li>- time savings looking for a parking space, walking to and from it</li> <li>- reduced car parking pressures for all, including solo drivers</li> <li>- increased travel options for those with no, or limited car access</li> <li>- social justice of those who may not be able to afford a car, but who still from time to time need one</li> <li>- reduced stress with less driving activity, not owning a car</li> </ul>	<ul style="list-style-type: none"> <li>- removed or reduced parking problems on and around the site</li> <li>- relieved local congestion</li> <li>- released parking spaces for more productive and profitable use</li> <li>- potential savings for the building and maintenance of the road system</li> <li>- demonstrated social responsibility</li> <li>- contribution towards sustainability and environmental targets (lower fuel consumption, fewer air emissions, cleaner air, and perhaps even less noise and certainly less solid and liquid waste) [2]</li> </ul>

To be environmentally friendly, car sharing has to be *complementary*, not *competitive* to the environmentally friendly transport solutions - public transport, walking and cycling. Integrated with these eco-modes, car sharing presents a city-friendly and environmentally-friendly car component that is employed selectively by its users. To sum up briefly: car-sharing contributes to serving the public good in a sustainable transport system [3].

#### 4. CONCLUSION

While well established in developed countries, car sharing is nascent in developing ones. The potential of car sharing here could be very large, but little is known about its markets, viability, or social and environmental impacts [4]. Macedonia is not an exception.

In order to reduce motorized traffic in cities, residents should be open to a lifestyle that relies less on cars. Alternative forms of car use such as car sharing have the potential to make a valuable contribution to more sustainable urban mobility [1]. Car sharing is often viewed as complementary to public transport, but is a more simple and flexible system to establish, since it does not depend on huge infrastructure investments. Car sharing might rather fast and immediate become an alternative to the private car [3].

Car sharing services have proven to be successful in different cities all over Europe and they have great potential to support sustainable transport in urban areas [1]. In that direction, the paper proposes a scheme for introduction of car sharing in urban areas in Macedonia.

Now, the broad experience is demonstrating that with proper organization, car sharing can be a very satisfactory transport arrangement. And that, by the way, is precisely what it takes to build a sustainable transport system: piece by piece [2].

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