

# One-way carsharing: which alternative to private cars?



## Results of the first major survey about the impact of a one-way car-sharing service (the case of Autolib' in Paris)



This study, conducted by 6t – bureau de recherche - a research-oriented consulting firm specialized in transportation and mobility issues- received a grant from the French Environmental and Energy Control Agency (ADEME).



The use of private cars in France has reached an inflection point: in large urban areas, **car-based mobility has decreased, whereas transit use has increased**. This trend stems from a growing dissociation between car ownership and use.

Accordingly, carsharing allows commuters to use a car occasionally without having to endure the downsides linked to its ownership. The practice is still relatively marginal (around 200,000 users in France in early 2014), but has experienced **an exponential growth and still has a sizeable development potential**.

**Carsharing will continue to develop**, due to the oil prices rise, the implementation of policies limiting the use of private cars in city centers and the

growing appeal of others modes of transportation.

In 2013, 6t-bureau de recherche conducted the **first French National Survey on round-trip carsharing<sup>1</sup>**, in order to measure and to understand its impacts on urban mobility. The results were:

- a sharp drop in the ownership and use of private cars;
- a sizeable increase in the use of all the alternative modes of transportation by people who would not have used them otherwise;
- an alternative to private car use that seems more profitable and more practical in an urban environment;
- an obvious addition to sustainable mobility policies.

## Evaluating the impact of one-way carsharing

Even if the majority of carsharing organizations function on a round-trip basis, several municipalities are currently inquiring about the interest and the impact of **one-way** programs (no obligation to return the car to the starting point or to pay for parking) and **self-service programs** (no obligation neither to reserve the vehicle, nor to anticipate the duration of the rental).

After having noticed that there was no study to date focusing on the uses and the impacts of one-way carsharing, **6t-bureau de recherche decided to conduct the first survey aiming at assessing the practice through objective criteria**.

The full report is for sale at [www.6t.fr](http://www.6t.fr)

1. French National Carsharing Survey (2013) conducted by 6t in partnership with Citiz (former France Autopartage) with the support of the ADEME.



# Understanding the phenomenon of one-way carsharing

## Carsharing:

A self-service car rental system, most of the time located in urban environments, that allows people to use of a vehicle with or without prior reservation in an occasional way.

### Round-trip or « classic » system

The vehicle is returned to the starting station. It is possible to reserve several hours in advance and the rental time must be specified. The average observed rental lasts for 5 hours and corresponds to 40 km driven, featuring especially suburban trips, or at least trips going beyond the city center.

### One-way system

The vehicle does not have to be returned to the starting station. It is not possible to reserve it several hours in advance and the rental time does not have to be specified. The average observed rental time is 40 minutes for a distance of 9 km, featuring trips taking place within a restricted perimeter (downtown area).

### Peer-to-peer (P2P) system

The transaction is made between private individuals. Operators responsible for billing and insurance carry out the system, and also charge a commission for each transaction. The vehicle must be generally reserved at least 24 hours in advance and the duration must be specified. The average observed rental time is at least a day, corresponding to more than 100 km driven and featuring interurban or suburban trips.

Autolib' is a one-way carsharing system operating in Paris city since 2011. With its 43,000 current subscribers<sup>2</sup>, Autolib' is today the largest one-way carsharing system in the world. As such, it represents the ideal field of study for understanding the practices of this type of carsharing.

**The aim of the study is not to perform a plain analysis of Parisian Autolib' users, but to better grasp the phenomenon of one-way carsharing.**

## STUDY FIGURES:

1 online survey conducted from November 2013 to January 2014.

1 169 respondents

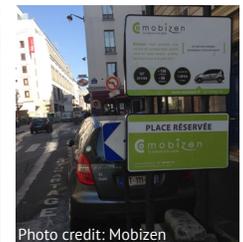
- 644 one-way carsharing users in the Paris metropolitan region (Autolib'); 
- 525 round-trip carsharing users in the Paris metropolitan region (Mobizen). 

Recruited through two channels:

- directly at the Autolib' stations by inviting the users to answer our online survey;
- diffusion of the questionnaire by the firm Mobizen among its users.

200 questions to characterize the use of carsharing and of other transportation modes.

The results were compared to those obtained through the French National Carsharing Survey (enquête nationale sur l'autopartage) conducted in 2013 by 6t, with a sample of **1,940 subscribers to round-trip carsharing programs outside the Paris metropolitan**.  



Two comparisons were made:

- the first one with a sample of round-trip carsharing users<sup>3</sup> (Mobizen service) living in the Paris metropolitan region, aiming at neutralizing the contextual bias linked to Paris specific (namely the density of public transportation and of alternatives transportation modes, low motorization rate, low use of private cars);
- a second one with a sample of round-trip carsharing users<sup>4</sup> living outside Paris metropolitan region order to compare the behaviors of the people living in this region with those of others French regions.

2. Figures at the end of January 2014.

3. Interviewed as part of this research

4. Interviewed as part of the French National Carsharing Survey (2013) conducted by 6t in partnership with Citiz (former France Autopartage) with the support of the ADEME.

## Autolib' users are mainly executives, but some students are also attracted by the service

**Autolib' subscribers are more educated than the average:** 72% have at least completed 4 years of higher education, whereas only 13% and 23% of the French and the inhabitants of the Paris metropolitan region have respectively done so. **Most of them (64%) are executives and have incomes higher than the regional average.**

We find similar characteristics among Mobizen users and, to a lesser extent, among carsharing users in the Paris metropolitan region.

On the contrary, Autolib' users with a net monthly income lower than €1,500 are three times more numerous than Mobizen's (7% and 2% respectively). This remark can be explained by the fact that **Autolib' attracts students** (8% vs. 1% for Mobizen). Moreover, Autolib's very high visibility implies that much more people know it (840 Autolib' stations out of 869 are on-street, whereas only 26 out of 115 Mobizen stations are on-street).

## Autolib': a substitute to private cars without the parking constraint

Users state they subscribe to Autolib' first to drive a car occasionally, like all the other carsharing programs. However this motivation is less strong in the case of Mobizen users (33% vs. 50%).

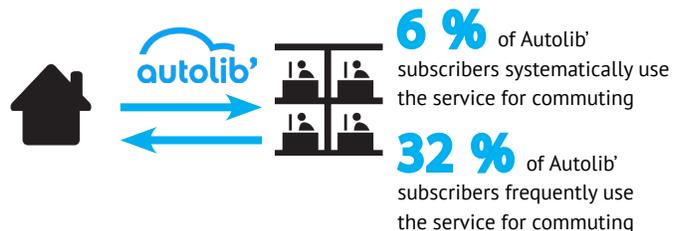
Besides, Autolib' use frequencies are much higher: **57% of Autolib' members use the service more than twice a week, whereas most of the other carsharing users (more than 80%) use the service less than three times a month.**

Correlated with the frequency of use, **the use of Autolib' for commuting is found to be sizeable.**

62% of Autolib' users have already used it for commuting, of whom 6% systematically use it for commuting and 32% who do it often. This

is an Autolib' particularity. In fact, round-trip carsharing is theoretically not interesting for commuting and it is indeed very rarely used for that purpose. Moreover, only 12% of Mobizen subscribers have already used the service to commute.

**67% of Autolib' users who think that Autolib' is more practical than a private car quote the reserved parking places as the main reason.**



## Autolib': a solution deemed more practical than public transportation

**25%** of Autolib' users state that the service is more practical and comfortable than public transportation

**18%** of Autolib' users state that the service is cheaper than owning a private car

**6%** of Autolib' users quote ecological reasons to explain why they became carsharing users

**Autolib' users do strongly prefer private cars and have a more negative perception of public transportation than other carsharing users.**

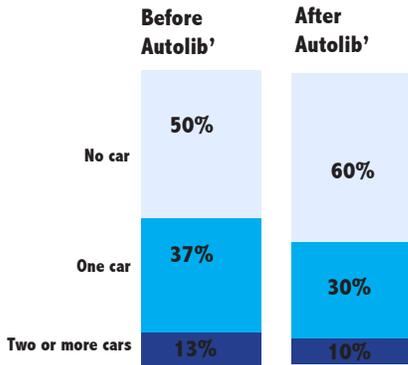
For 1/4 of the users, Autolib' is first of all a more practical and comfortable service than public transportation, whereas only 1% of Mobizen subscribers use carsharing because they prefer it to public transportation.

**The economic motivations only come in second place:** only 18% of the users subscribed to the program because it is cheaper than using a private car, whereas this figure reaches 31% for Mobizen users.

For all carsharing users, **ecological values play only a minor role in the decision of using Autolib':** only 6% of Autolib' users quote the environmental variable to explain why they joined the service.

# Carsharing systems and demotorization

## ➤➤ Autolib' (one-way carsharing in the Paris metropolitan region)



**-43 km**  
per month/ user

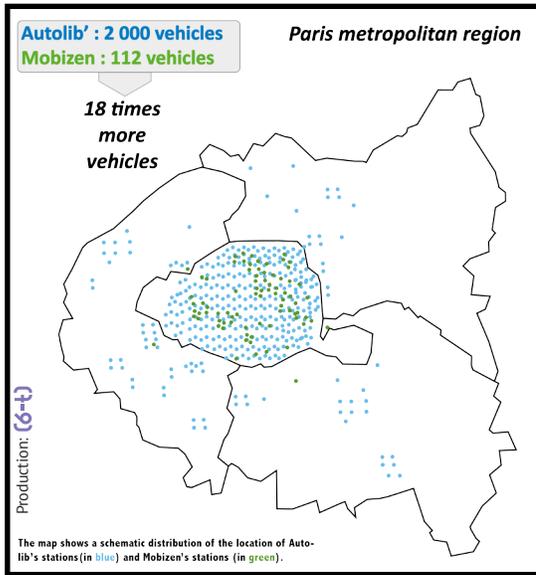
**- 1 849 000 km**  
per month in total

An Autolib' vehicle replaces 3 private cars and frees 2 parking spaces.

A stated 11% decrease in the vehicle kilometer travelled (private vehicle + Autolib').

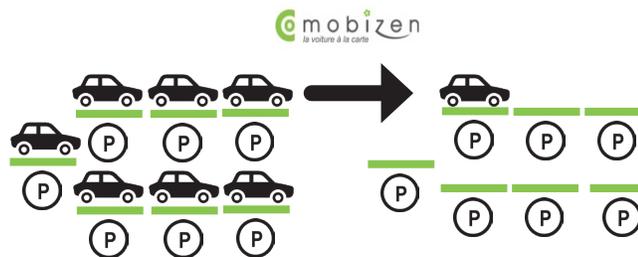
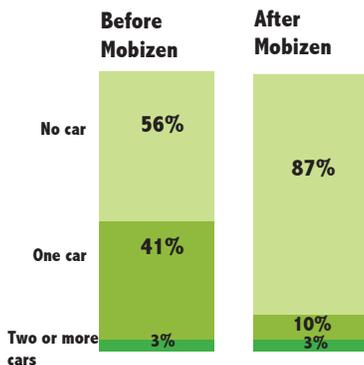
A 23% reduction in the number of private vehicles owned by Autolib' users after their subscription.

- Autolib' is a transportation mode mainly used by Parisians moving within Paris. Nevertheless, the availability of the service in the suburbs makes it possible to have customers who live outside of Paris city. Given the variety of locations, there are some trips to and from the suburbs. These types of trips remain a minority though;
- The average rental lasts for 40 minutes and corresponds to a driven distance of 9 km. Rentals reach a peak during weekends (23% more in a weekend day compared to a week day);
- The main purposes of Autolib' trips are family or friends visits, followed by leisure trips (sport, culture, nature...). Autolib' is also used for commuting.



## ➤➤ Mobizen (round-trip carsharing in the Paris metropolitan region)

- Mobizen is a transportation mode mainly used by Parisians to go outside of Paris city;
- The average rental lasts for 5 hours and corresponds to a driven distance of 40 km. Rentals reach a sharp peak during weekends (89% more in a weekend day compared to a week day);
- The mains purposes of Mobizen' trips are family or friends visits, followed by leisure trips (sport, culture, nature,...). Mobizen is almost never used for commuting.



**-127 km**  
per month/ user

**- 308 229 km**  
per month in total

An Mobizen replaces 7 private cars and frees 6 parking spaces.

A stated 45 % decrease in the vehicle-kilometer travelled (private vehicle + Mobizen cars).

A 67% reduction in the number of private vehicles owned by Mobizen users after their subscription.

# Autolib' competes with private cars, but also with all the other transportation modes

After subscribing to Autolib', users tend to use cars, but also alternatives to cars, less: Autolib' then also captures trips that were previously done with other modes of transportation.

On the contrary, concerning Mobizen subscribers as well as users of carsharing schemes outside the Paris metropolitan region, we remark an increase in the daily use of all the alternative transportation modes.

**Evolution of the share of respondents who daily use different transportation modes before and after subscribing to a carsharing system.**

	One-way carsharing in Paris metropolitan region (Autolib')			Round-trip carsharing in Paris metropolitan region (Mobizen)			Round-trip carsharing out of Paris metropolitan region		
	Share of users before	Share of users after	Evolution	Share of users before	Share of users after	Evolution	Share of users before	Share of users after	Evolution
Private car	13%	5%	-63%	9%	1%	-93%	15%	4%	-76%
Public transportation	61%	50%	-18%	64%	65%	+2%	40%	45%	+14%
Bicycle	3%	2%	-25%	11%	10%	-6%	29%	35%	+20%
Bikesharing	4%	4%	0%	5%	7%	+30%			
Walking (for complete trip)	25%	23%	-7%	35%	36%	+4%	36%	38%	+6%
Motorized two-wheeler	9%	5%	-42%	8%	8%	0%	4%	4%	0%
Carsharing	/	16%	/	/	0,2%	/	/	0,5%	/

## ➤➤ Autolib' also replaces motorized two-wheelers...

On the one hand, the number of motorized two-wheelers owned by Autolib' users has fell by 15% after joining the service, while it has remained the same for Mobizen users. On the other hand, the frequency of motorized two-wheelers daily use has fell by 42% after joining Autolib', whereas it has remained the same for other carsharing users.

**This phenomenon can be explained by the flexibility offered by one-way carsharing. This characteristic responds to the expectations of motorized two-wheeler users:** the possibility of travelling door-to-door, the possibility of avoiding the parking constraints associated with private cars and the possibility of keeping the security advantages of a car (accident rate, theft, etc.).

## ➤➤ ... and contributes to a strong fall in taxi use.

Before subscribing to Autolib', many users used to take the taxi every week. The number of people doing so has been divided by three after joining Autolib' (going from 19 % to 6%). **Besides, the number of users who never use the taxi has doubled after joining Autolib'**, going from 11 % to 20 %. This considerable fall is specific to Autolib', since 69% of its users state that they have used taxis less, whereas only 22% of Mobizen users and 9 % of the subscribers to carsharing systems located outside the Paris metropolitan region have affirmed so. We can think that **Autolib' has taken market share from taxi companies**, because it is successful at responding to similar needs at a lower price and in a more accessible way (density of stations, 24h availability).

## How to make the most of one-way carsharing in order to trigger sustainable mobility?

At the user level, Autolib' replaces less cars and takes out less vehicle-kilometer travelled than round-trip carsharing. Nevertheless, on the one hand there is a transition from thermal to electric vehicles. On the other hand, its density enables Autolib' to be the largest carsharing system in France and in the world today, thus having a considerable effect on mobility.

**Convenience can set the ground for a pattern of uses that does not feature multimodal trips (combining the different transportation modes). Therefore, Autolib's convenience makes that subscribers use carsharing more often than they used to drive before joining a carsharing program (16% vs. 13% «every day or almost»).**

This trend is not at all confirmed among the subscribers to round-trip carsharing systems, who drive a shared vehicle less often than they used to drive their own vehicle. **The return trips, the mandatory reservation and the less dense offer together tend to encourage round-trip carsharing users to combine the different alternative transportation modes every day.**

**The efficiency of Autolib' seems to heavily depend on the density of the offer:** 5 stations and 11 vehicles per km<sup>2</sup> in Paris.

Can other municipalities propose a similar level of density for one-way carsharing? If this is not the case, can a less dense system still be efficient?

### THE COMPLEMENTARITY OF ROUND-TRIP AND ONE-WAY CARSHARING

Even if round-trip and one-way systems are similar, their impacts are not the same: they are two different, yet potentially complementary mobility options. Besides, people subscribing to both Autolib' and Mobizen are the ones displaying the most ecological mobility practices: 87% of them do not own a car (compared to 60% of Autolib' subscribers only) and continue using the whole set of alternative transportation options (transit, biking, walking, etc.). Somehow, only 2% of Autolib' subscribers have signed up to Mobizen as well.

The development of carsharing will certainly require a reflection about the hybridization of the different systems and about an integration with complementary transportation modes (transit, bicycle,...):

- a fare integration between round-trip, one-way, peer-to-peer carsharing systems, but also with other transportation modes;
- a one-way system that would require a prior reservation (including the starting station, the duration of the rental and the final station);

- a round-trip system that would occasionally allow users (according to the time and the destination) to do one-way trips;

Other combinations that would foster ecological behaviors and that could optimize the regulation of the services

#### A MONITORING PANEL

The practice of carsharing can take some time to produce sizeable effects on people's mobility, as users gain experience and learn how to better use the service progressively. Among the carsharing systems we analyzed for this survey, Autolib' is the most recent one (2 years); that is why **6t created a monitoring panel** that will be asked again in fall 2014 in order to grasp the evolution of one-way carsharing's influence on mobility behaviors.



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The full report is for sale at [ww-w.6t.fr](http://ww-w.6t.fr)