Measure title: **Car Sharing Service in Genoa**

City: **Genoa** *Project:* **Civitas Caravel** *Measure number:* **9.4**

A Introduction

A1 Objectives

The general objective was the improvement and diffusion of car sharing in Genoa to make it a diffused mobility service fully integrated within the city transport system**.** In particular:

- **Objective 1** - to extend the car sharing service in Genoa over the target areas with the availability of 50 car sharing parking spaces and the use of about 90-100 car sharing vehicles, a part of which powered by hybrid or bi-fuel engines (25%);
- **Objective 2** – to include the car sharing in the services that the Flexible Services Agency is able to use and to offer;
- **Objective 3 -** to set up a mixed car sharing service in cooperation between the Municipal Public Entity of Genoa and the local car sharing operator with 13 vehicles dedicated to this type of service; the aim is to achieve a more rational use of the vehicles by maximizing their use.
- **Objective 4 –** to introduce the use of car sharing service for good distribution in the central area of Genoa with the introduction of 10 cargo vehicles in the car sharing scheme;
- **Objective 5**[1] **-** to introduce the use of car sharing service for impaired persons with the purchase of a special car and the organization of the new type of service dedicated to these persons.
- **Objective 6** - to promote the knowledge of cs service.

As described in the C3 paragraph some results has been verifiable by:

- successful gradual realisation of car sharing in Genoa with well functioning technology and satisfied users;
- to obtain about 2000 users as a result of the service in the years of the project within the relevant areas;
- better use of cars in the urban environment and reduction of the number of cars owned by the car sharing users of at least 400 cars;
- to reach at least 15% of the car sharing users as subscribers of public transport season tickets.

A2 Description

The car sharing service in Genoa belongs to the Italian National Circuit ICS.
The creation of a national organism which guarantees the respecting of service standards and stimulate the development of car sharing has been high lighted as a strategic factor in the growth of car sharing.
ICS (Iniziativa Car Sharing) was created for this purpose in October 2000 in the form of an Agreement between Municipalities, to develop at a national level car sharing services with a “professional” approach and a high quality service level and to co-ordinate the different Local Car Sharing Operators in a unitary National Circuit.

[1] This point is an additional objective in comparison to what was foreseen at starting time. This objective has been included in the measure because is a contribution to gender actions.

ICS has a light structure and uses to carry out her activity the structures of Modena and Genoa Municipalities. The ICS supreme institution is the "Conferenza degli Assessori" that takes all the political and strategic decisions and has a President with political representation powers, while the Director is executive institution with ordinary administration powers. The local operators have a representation organism called "Comitato dei Gestori di ICS" that has the aim of co-ordinate the decisions about common factors to the national circuit. The local operators have also formed another institution called "Consorzio di Acquisto Gestori Circuito Nazionale Car Sharing" to provide a united service and to guarantee the respect of the ICS standards by all the local operators.
The Ministry and the Local Authorities follow the aim to open the market to as many economic operators as possible, but at the same time guaranteeing coherence in the global project, avoiding the fragmentation in many local situations without any connection and coherence among them. It was therefore considered of prime importance to create all the basis to form a rational car sharing circuit that, even with collecting different operators in accordance with different local circumstances, would guarantee:

- interoperability: every user must be able to access the service in the same way, with the same procedures and the same means, on a national level;
- a homogeneous interface towards the consumer for all the normal service access operations;
- an unitary service identity;
- the respect of minimal service standards for all the operators within the car sharing circuit.

In line with the objective of maximum integration between car sharing and public transport, ICS and the local operators planned to locate car parks in the areas where are interchange nodes of public transport, as train, bus and metro line stations to give a real integration. These parks can be easily individuated, because car sharing parks are signed with the national circuit logo "Io guido car sharing" and with the logo of the local operator.

Figure 1: National Circuit Logo of car sharing service.

The distinctive characteristics of ICS national circuit can be so summarized:

- the car sharing users have free access to street parking, to LTZ, to public paying parking lots and free use of the PT reserved lanes;
- complete interoperability of the circuit (unique subscription and single user contract for the whole circuit);
- free on street parking;
- reserved fleet for limited time period for public and private organisations;
- possibility to have "intermediate level" customers (such as hotels, tourist companies, etc.);
- common branding of the circuit.

The cs system operates in this way:

- for all current operations and for information, customers refer to a single unified national call center, which operates 24 hours, to ensure a unitary identity to the service, to check the availability of requested vehicles;
- all over the whole circuit the same personal smart card, required to open and close the vehicles, protected by a PIN code visual identity, has been created: the logo and colours are distinctive to the national circuit and are always sided by the logo of the local circuit operator on all the vehicles, signposts indicating the reserved parking areas, and other communication media.

Thanks to this architecture it is possible to ensure a homogeneous service (also from the point of view of image perception) that can be reproduced all over the territory. A strategic choice which allows to easily enlarge the geographical extension of the reference market.
At the same time the adopted approach requires advanced technologies. The technological system for Car Sharing service management has been specifically developed by ICS and is used by all the local Operators belonging to the circuit.
It is based on:

- a distributed software system, that through a VPN network connects all the local operators servers and the call centre;
- a board computer unit to be installed in all the vehicles, comprising of a display with keyboard, a GSM system and a GPS with the appropriate antenna, hands-free kit and smart card reader.

The software system and the onboard computer make up the heart of car sharing in Italy's technological package, able to guarantee to the customer a high and uniform quality standard of service, and to the operators, a level of efficiency fitting to business growth.
The customers are provided with the following capabilities:

- interoperability
- the possibility to make bookings, cancellations or alterations by telephone, Internet or by WAP
- hands-free connection between the vehicle and the call center for requesting information, assistance or road assistance in the event on an emergency
- a variety of ways to pay (a pre-paid card, credit card, direct debit from bank account)

To the operators the system allows:

- the management of bookings, cancellations, alterations and the various alternative travel options
- a continual update of vehicle availability and their location in the controlled car parks
- management of a variety of customer profiles
- development and modification of charges relating to the different contract types
- monitoring vehicle maintenance
- automatic billing
- processing of service reports and statistic forecasts.



Figures 2: One of the vehicles of the Genova Car Sharing fleet and the technology system in the car (the smart card reader, the display screen and keyboard of on board computer).

This standardisation of the service does not however mean a centralised management of the circuit. European experience has highlighted the effectiveness and the efficiency of car sharing (assessable with the aim of optimising the ratio between the number of customers and vehicles) depends both on typical general business factors and on purely local factors, such as the variability of territorial and socio-demographic conditions or the performance of the public transport network. For this reason, the approach chosen by ICS allows ample levels of autonomy to the local operators. Within the limits fixed by the service standards, the individual local operators are autonomously in charge of all the operational, commercial and managerial aspects of running the business. In particular they are responsible for their price

schemes and policies. The organisational model chosen by ICS could be so defined a "federative model".
Concerning the Genoa reality the Civitas Caravel project has allowed to increase the service in the urban area and to create new types of car sharing services (for goods distributions, for impaired people, for a certain groups of workers) integrated each other in the same scheme.
In particular, about **the extension of the service** we can give some general data.
The number of cars has been increased from 16 to 98 during the Civitas period and a good coverage of the urban area has been achieved through the improvement of car sharing parking places from 15 to 52.

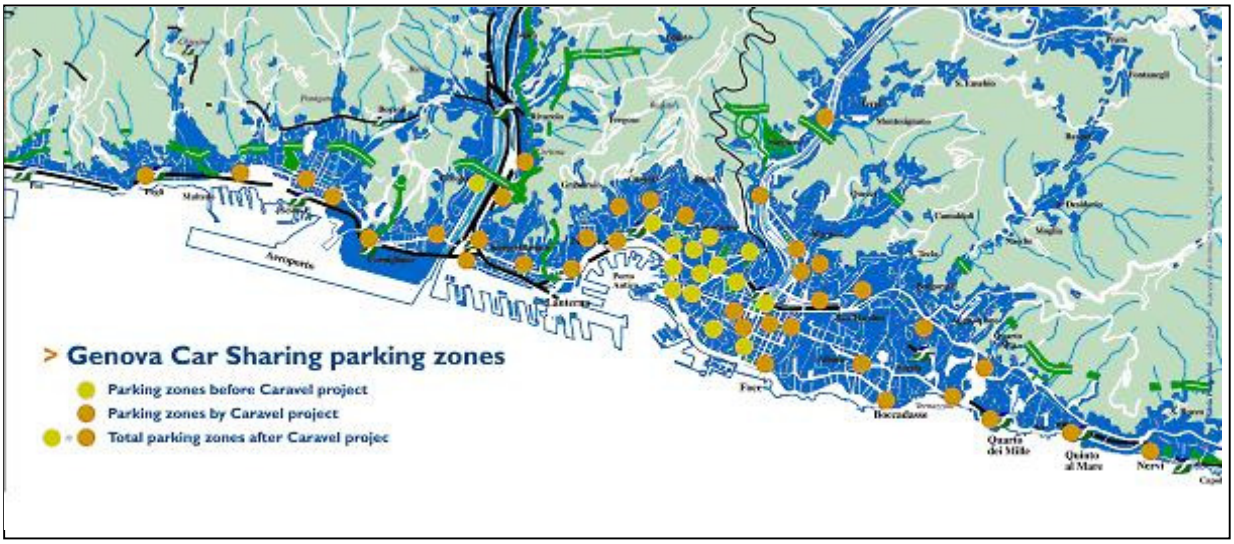


Figure 3: City map with the car sharing parking places before and after Caravel.

A significant increase of users took place: 417 active contracts at January 2005; 1.804 active contracts at September 2008. An average of 1.500 Kms per car are monthly driven by car sharing users.
The number of total users at September 2008 was 2.200 about. The growth of car sharing adoption in Genoa shows a rate higher than the average growth in the rest of Italy.

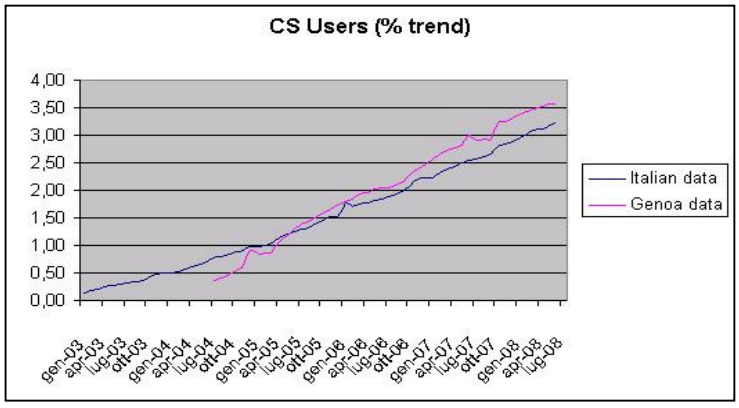


Figure 4: % trend of CS users on Genoa and Italy site.

An innovative scheme has been created during the Caravel project relating to the use of car sharing for a specific target of people: **the workers of the Municipal Public Entity of Genoa**. The service scheme has been developed to reserve the use of the cars by the workers during the working hours and let them available to other users during the free time.
Relating to an organizational point of view:

- the Public Entity individualizes, within the different Offices, the users of the service and a reference person (Service Responsible) that is the interface with Genova Car Sharing (GCS - the local operator) for all the problems related to the service; the Responsible person transmits to GCS the list of the employees of the Public Entity qualified to drive the cs vehicles;
- the CDG defines the parking places for the "mixed" service in relationship with the demands of the Offices involved in the project;
- in the optics of the interoperability the Public Entity can access the service offered in the other cities by the other local operators of the ICS circuit previous a letter sent to GCS from the Responsible person, pointing out the smart card that have to be used;
- the cars uses out of the working time must be authorized from the Responsible of the Service with a written communication sent to GCS (the service is named “mixed” because of the possibility to used the car for no-working aims);
- the cs service costs the half rate for the employees of the Municipal Public Body.
- Now 13 vehicles are available to be used for the “mixed” service. At September 2008, 250.873 kms have been driven on car sharing cars by the Public Body of Genoa for working purposes.

The development of this “mixed service” scheme supported by specific procedures and management software is an innovation element, and give the possibility to extend the potential market of car sharing services also to big organisations, with specific needs in the use of their fleet. This is very important, because the service can capture a specific demand with the aim to extend the cs benefit on the urban territory more and more.
The car sharing service has been also diffused for a specific aim: **the goods distributions** in the historical centre of Genoa (in collaboration with the Measure 10.1 - Enlarged good distribution in Genoa). 10 vans has been introduced in the car sharing fleet during the Caravel period and an agreement for the use of these vehicles has been signed between the Car Sharing Operator and the Shopkeepers Associations under the patronage of the Municipality of Genoa.

Figure 5: A Van vehicle in Genoa.

Another objective has been an experimental car sharing service (with a single special car) **for disabled persons**. The car is equipped to allow to drive it by disabled persons themselves, increasing in this way their degree of freedom, covering the needs of 90% about of disability. A special service scheme was set up to satisfy the specific needs on these users (car preparation and car delivery at home if required). The idea was developed with the associations of disabled people and had a positive acceptance by the City Council and other stakeholders.
We underline that this type of service is an experiment, so only one car has been transformed for disabled people.

Figure 6: Logo of the cs service for disabled people and the special car.

Many **actions of promotion** have been developed: street events, direct marketing activities, information campaign on media (local radio, TV, newspapers), participation to local fairs.

Figure 7: Some promotion actions.

B Measure implementation

B1 Innovative aspects

In general the measure represents a new conceptual approach of mobility.
In particular the innovative aspects of the measure are:

- **New mode of transport exploited**: the car sharing service represents itself an innovative mobility service for Genoa and for most of the Italian realities. The diffusion of a new culture of the use of car is a contribution to a more rational modal choice by the citizens, internalization of external costs of transportation.
- **Targeting specific user groups**: the car sharing service for impaired persons represents an innovative mobility service for Genoa and in the world: this is the first time that a city have this kind of service (even if with a single special car for the all urban area).
- **New policy instrument**: the definition of all the contractual aspects between the Municipality of Genoa and the supplier of the car sharing service is an important innovative aspect. The details of the "mixed" service has been described in the A2 paragraph.
- **New organisational arrangements**: the development of a mixed car sharing scheme, which combines a Corporate car sharing scheme with the current and standard car sharing use; the development of specific tools and procedures to manage this scheme is an innovation not only locally, but with respect to the state of the art too.
- **New physical infrastructure solutions**: as described in A2 paragraph the extension of parking places in urban area has been remarkable: from 15 before Caravel to 52 after the project.

B2 Situation before CIVITAS

Genoa belongs to ICS (Iniziativa Car Sharing), an Italian consortium of 17 Italian cities and 3 provinces devoted to the diffusion of car sharing systems. The Municipality has appointed as service operator a shared company, Genova Car Sharing, held by the local mobility agency (AMI) and a private partner.
The concept of the car sharing scheme in Genoa has been developed in the framework of the ICS initiative and of the MOSES project co-funded by the European Commission. The ICS organization is described in the A2 paragraph.
The service has been launched in Genoa in July 2004, according to the developed master plan of the service. Before the CARAVEL project the service has been carried out with a fleet of 16 cars available only in the central area of the city. In particular, the served areas were the very central ones of "Castelletto" and "Portoria" followed by "Carignano". Moreover before CARAVEL: the parking places were 15, all in the central area; the number of users was 500; new forms of car sharing (as the "mixed" service) didn't exist
So the contribution expected by CARAVEL was a good travel way change by citizen in Genoa for a more sustainable mobility, with the possibility to have more vehicles, parking places, more urban zones covered by the service. To reach this main aim it has been decided that the result were verifiable by the achievement of the targets indicated in the A1 paragraph.
In the section C the "Evaluation" can tell us the situation after CARAVEL.

B3 Actual implementation of the measure

The measure was implemented in the following stages:

Stage 1: Scheme design (from February 1st, 2005 – to February 1st, 2006) – The stage included the development of a special kind of mixed car sharing scheme that allows to contemporarily manage special dedicated fleets in a Corporate car sharing scheme and traditional car sharing scheme. This scheme has been implemented involving the Municipality of Genoa as a first customer. This kind of scheme needed the definition of all the procedures for reservation, access to the service, etc. and it has required to adopt the software tool used to manage car sharing aiming at managing multiple levels of reservation and dealing with this scheme.
From the contractual point of view, it has been decided that for all the project time the Municipality paid the tax for the use of the vehicles, while the local operator (Genova Car Sharing) paid the other charges (insurance, periodic cleaning, possible damns repair, incidents management, etc.). The organizational point of view is described in A2 paragraph.

Stage 2: Integration into the FAMS framework (from August 1st, 2005 – to February 1st, 2007) - The stage included the analysis of the possibility to use car sharing for disabled people. The idea was developed with the associations of disabled persons and had a positive acceptance by the City Council and other stakeholders.
During this stage a questionnaire has been submitted by mail to 1000 impaired citizen. By the results it emerged that the 58,3% of the people that had compiled the questionnaire (about 60) believed they could have had need to use the service, 33,3% would have used the cs but only with an accompaniment service, while 8,3% were not interested. Of these possible users, the 77,1% would have used the car sharing to replace the own car only if the car temporarily is spoiled; while the 8,6% would have used the service because not in possess of an own car and 2,9% for necessity of a second car in family. Moreover the 71,4% of those that would had use the service, they would have done it less than once a month, while the 8,6% once a month and 14,3% once a week. Concerning the time of the single run, it resulted that the 51,4% would have had need that the car remained to disposition for more than 12 hours, while 25,7% for 1-4 hours and 22,9% for 4-12 hours.
Considering these results, the system has been organized with these characteristics:

- integration with several associations for disabled people with the aim to promote the service;
- integration of the service with the possibility to deliver the car at home or other place indicated by the users;
- the contribution to the management costs by a Local Public Body (Province of Genoa);
- the adoption of a car able to maximize the possibilities of use, therefore with also the transport of passengers in wheelchair;

Stage 3: Design and implementation of a special car sharing service for disabled persons (from June 1st, 2006 – to February 1st, 2009) – The stage included the set up of a special experimental car sharing service (with a single special car) for disabled people, able to cover the needs of 90% about of disability. In particular, the Municipality of Genoa had buy the car and created a special parking place in the urban centre (near Piazza De Ferrari, the main square of Genoa); then a Cooperative for impaired people named “La Cruna” by “Terre di Mare”, an info point for the citizen, managed the activities of call center, preparation of the vehicle, delivery / retire at home, to allow the real use of the service. The Province of Genoa has financed the project with 8.000 euro to cover the possible operating deficit coming from the service.

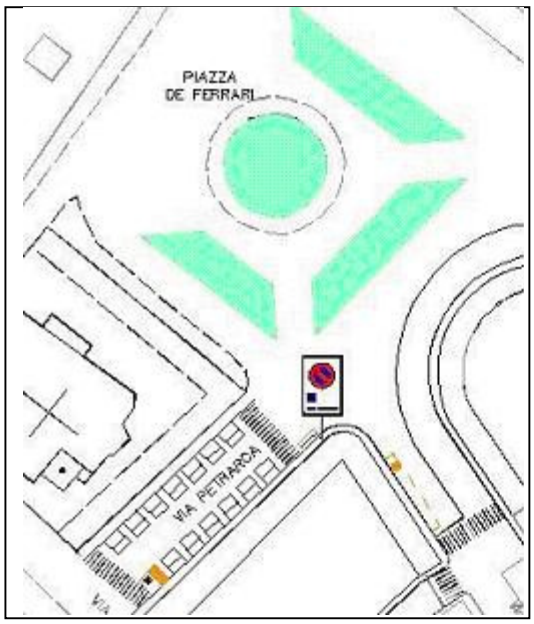


Figure 8: Parking place for the special car of disabled people.

Stage 4: Definition of the operational plan for the launch of the car sharing service (from February 1st, 2005 – to February 1st, 2006) - The stage included the elaboration of the operational plan for the improvement of the service, with the definition of all the aspects of the operational plan for the enlargement of the service in the target areas: type and number of vehicles to buy per month, number of parking places to open per month, where increase the service with the new parking places. Naturally these choices also depended from economic aspects. This stage has been very important because without a good plan the risk was not to reach the breakeven point of the balance considering a certain budget. About this point it's possible to verify the evaluation indicators reported in the C2.1 paragraph:.

- evaluation of the revenue from the service
- evaluation of the cost from the service
- evaluation of the cost of the measure and of the attainment of breakeven point.

Stage 5: Cars procurements procedures (from May 1st, 2005 – to February 1st, 2006) – The stage included tenders and other procedures to provide the cars for the service (economy cars, utility cars and cargo).

Stage 6: Set up of the technological system (from August 1st, 2005 – to February 1st, 2007) – The stage included the equipment of the new car, the improvement of the reservation software, infrastructures (parking places, etc.) and the set up of the system.

Stage 7: Definition of the procedures for the management of the mixed car sharing scheme (from August 1st, 2005 – to May 1st, 2006) – The stage included the definition of all the operational scheme(see A2 paragraph) and the procedures to manage the mixed car sharing service for the Municipality of Genoa; definition of all the contractual aspects between the Municipality of Genoa and the supplier of the car sharing service.

Stage 8: Gradual launch of the service (from May 1st, 2006 – to February 1st, 2008) - The stage included the development and launch of the car sharing system and its gradual extensions. The launch has been gradual, respecting the progression foreseen by the operational plan. The gradual lunch has been chosen to better

balance costs and revenues of the service. Generally one or two parking places have been activated at each time. The expansion of the service covered all the contractual period. This stage also included all the communication and advertising activities.

Figure 9: Parking places for car sharing vehicles.

Stage 9: Personnel training (from February 1st, 2006 – to May 1st, 2006) - The stage included training activities to employers who has to manage the available cars at the Municipality's disposition.

Stage 10: Extension of the service (from February 1st, 2008 – to February 1st, 2009) The service has been gradually extended according to the designed plan. Here is a map with the areas of the extension of the service. In A2 paragraph you can see the city map with the car sharing parking places before Caravel (Figure 3).

Figure 10: Map with the areas of the extension of the service.

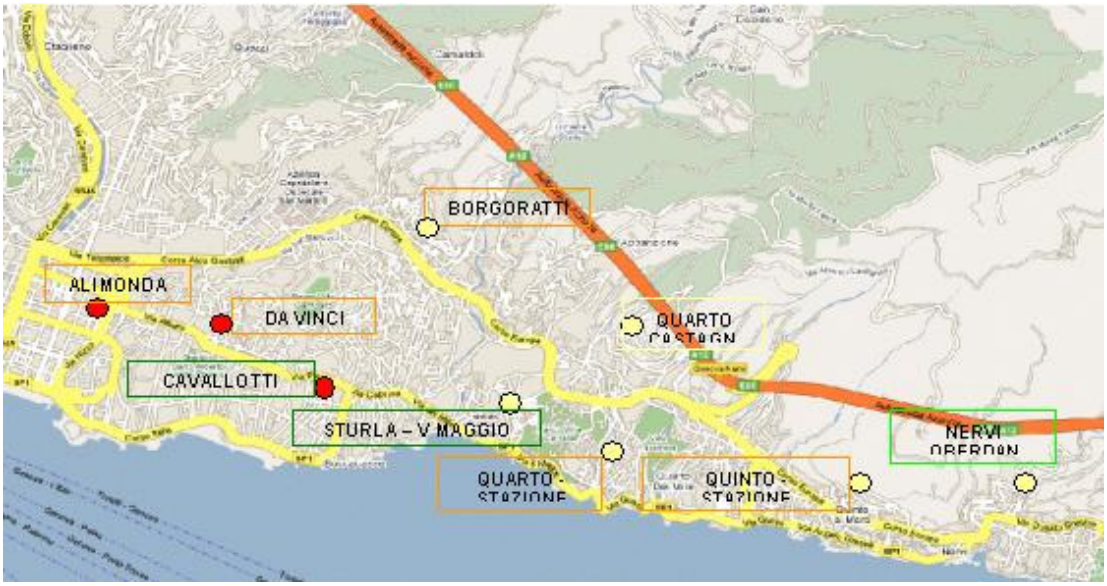
The parking areas for the extension of the service has shown here per areas of Genoa territory. The red points are the new parking areas foreseen for the first six month of the reference period; the yellow points concern the second six month of the period.

WEST AREA

WEST – MIDWESTERN – DOWNTOWN AREAS

BISAGNO VALLEY

EASTERN AND EAST AREAS



Figures 11: Maps with the parking areas for the extension of the service.

Stage 11: Promotion of car sharing service (from November 1st, 2005 – to February 1st, 2009) – The stage has foreseen promotional and communication campaign for the citizens, direct marketing activities, information campaign through direct information and media (see also the A2 paragraph).

Figure 12: Some promotion actions.

Stage 12: Evaluation of the service (from November 1st, 2005 – to December 1st, 2008) - All the evaluation activities have been performed according to the evaluation plan.

B4 Deviations from the original plan

The overall objectives have remained the same, but there has been some changes during the first part of the project:

- **Integration into the ECOPOINTS scheme, cancelled task** – The ECOPOINTS scheme is a way to reduce the flow of not clean vehicles in certain zones of the urban area. The inclusion of car sharing into the ecopoints scheme was abandoned. The reason is that the ecopoints scheme is currently developed by the public transport company and the focus of the measure has been strictly the public transport; so there was basically no space to include car sharing into the scheme.
- **Design and implementation of a special car sharing service for disabled persons, added task** - In addition to the foreseen objectives, a new one was added, that is to set up a special experimental car sharing service for disabled persons, as a contribution to the gender actions.
- **Reduction of number of cars for the service** - The target number of users over the project horizon remain the same, but we had experienced that the number of users per car is higher than foreseen; this means that the service level foreseen for the city can be achieved with a smaller number of cars. According to the recorded indicators, the target of 2000 users has been reached with 90 –100 cars instead of a fleet of 120 vehicles.

B5 Inter-relationships with other measures

The measure is related to other measures as follows:

- **Measure 5.1** - **Transition strategies for clean vehicle fleets in Genoa** – The 25% of car sharing fleet is composed by clean vehicles (hybrid or bi-fuel).
- **Measure 7.1 - Integrated access control strategy and road charging scheme in Genoa** – Special conditions have been foreseen to car sharing vehicles accessing the road pricing area.
- **Measure 8.4 - Agency for flexible transport services in Genoa** – Car sharing has been introduced in the services that the Flexible Services Agency is able to offer.
- **Measure 10.1 - Enlarged good distribution in Genoa** – It has been foreseen the use of car sharing service by shopkeepers for goods distribution in the historical centre of Genoa (van sharing).

C Evaluation – methodology and results

C1 Measurement methodology

C1.1 Impacts and Indicators

The evaluation of this measure consists in the monitoring, all over the duration of the project, of the development of the level of the service and of its use. Many quantitative and qualitative parameters (derived from direct market analysis, customer satisfaction reports and surveys) have been used to give an exhaustive view of the success of the actions.
The evaluation has taken place with a strong interrelation with similar activities under development at a national level by ICS: in fact at national level each local operator have to provide some data (those that in the table below have "ICS" in the "Source of data") to the central system of ICS. Besides several data have been provided by the local operator, Genova Car Sharing. The data coming from direct market analysis and surveys have been built by companies specialized in the sector, that have done surveys through questionnaires and interviews.
Here is the table of Indicators and a detailed description of the indicators methodologies:

Evaluation Category	**N°**	**Indicator**	**Units**	**Source of data**	**Methodology for indicator construction (survey, modelling, etc)**	**Details about the methodology for indicator construction**
transport		User number	-	ICS	Measurement	Monthly monitoring of the service
transport		Number and kind of cs vehicles (economy, utility, cargo)	-	ICS	Measurement	Monthly monitoring of the service
transport		km and hours covered	km/month – h/month	ICS	Measurement	Monthly monitoring of the service
transport		% of use of cs fleet	-	ICS	Measurement	Monthly monitoring of the service
transport		Pro-capite use (for each cs user)	km/user month – h/user month - ride/user month	ICS	Measurement	Monthly monitoring of the service
transport		Km driven by each cs vehicles	Km/car	ICS	Measurement	Monthly monitoring of the service
energy	3	CS vehicle fuel efficiency	l/100 km	ARE Liguria	Modelling	Derived from a local agency specialized in the field
society	13	Awareness level	-	ICS	Direct survey	Direct survey
society	14	Acceptance level of the service	-	ICS	Direct survey	Direct survey
transport	21	Vkm by cs vehicle type	km/month	ICS	Measurement	Monthly monitoring of the service
transport		% of mobility	-		Measurement	Ratio between number of car

Evaluation Category	N°	Indicator	Units	Source of data	Methodology for indicator construction (survey, modelling, etc)	Details about the methodology for indicator construction
		satisfied by car sharing				sharing rides and trips generated by private/public vehicles from areas with cs parking spaces
society		User's change in mobility behaviour	-	ICS	Direct survey	Direct survey
society		Effectiveness of the service	-	ICS	Survey	Survey
economy	1	Evaluation of the revenue from the service	€/user - €/car	Genova Car Sharing SpA	Measurement	Derived from balance sheet of Genova Car Sharing SpA
economy	2	Evaluation of the cost from the service	€/user - €/car	Genova Car Sharing SpA	Measurement	Derived from balance sheet of Genova Car Sharing SpA
economy		Evaluation of the cost of the measure and of the attainment of breakeven point	various	Genova Car Sharing SpA	Measurement	Business plan of Genova Car Sharing SpA
transport		Number of cs parking place	-	ICS	Measurement	Monthly monitoring of the service
society		CS users allocation for age brackets	-	ICS	Direct survey	Direct survey
society		CS users allocation for job	-	ICS	Direct survey	Direct survey
society		Geographical distribution of cs users	-	ICS	Direct survey	Direct survey
transport		Number of cs rides	-	ICS	Measurement	Monthly monitoring of the service

Table 1: Evaluation indicators.

C1.2 Establishing a baseline

The car sharing service has been launched in Genoa on July 2004, so all indicators are related to successive period (September 2004 – January 2005). In particular, see the table above with all dates and data as baseline. The results of baseline data are discussed in C2 paragraph.

Indicator	Baseline data	Baseline dates
User number	417	Jan 2005
Number and kind of cs vehicles	8 economy , 7 utility , 1 cargo	Jan 2005

Indicator	Baseline data	Baseline dates
(economy, utility, cargo)		
km and hours covered	44.049 km/month 5.425 h/month 30.709 km/month 3.184 h/month	Jan 2005 Average of first 7 months of the service (in 2004 year)
% of use of cs fleet	45,57% 27,24 %	Jan 2005 Average of first 7 months of the service
Pro-capite use (for each cs user)	106 km/user month 13 h/user month 1,19 rides/ user month 102 km/user month 11 h/user month 1,28 ride/user month	Jan 2005 Average of first 7 months of the service
Km driven by each cs vehicles	2.753 km/car month 1.937 km/car month	Jan 2005 Average of first 7 months of the service
CS vehicle fuel efficiency	urban/suburban/mixed Economy: (Punto): 8,4/5,6/6,6; Utility (Multipla): 11,9/7,5/9,1; Cargo (Doblò): 11,9/7,6/9,2;	2005
Awareness level	spontaneous: 54,0% total (stimulated answer): 64,7%	Sept 2004
Acceptance level of the service	19,1%	Sept 2004
Vkm by cs vehicle type	economy: 2.816 km/month utility: 2.939 km/month cargo: 947 km/month	Jan 2005
% of mobility satisfied by car sharing	0,13%	Jan 2005
User's change in mobility behaviour	see C2.5 paragraph	Sept 2004
Effectiveness of the service	see C2.5 paragraph	Sept 2004
Evaluation of the revenue from the service	62,94 €/user 1.514,47 €/car	Jan 2005
Evaluation of the cost from the service	18,81 €/user 452,71 €/car	Jan 2005

Indicator	Baseline data	Baseline dates
Evaluation of the cost of the measure and of the attainment of breakeven point	Breakeven point: cars: 65 Use: 49% per 24h subscriptions: 1.600 rides/user month: 1,6 revenue/ride: 50 € Average ride: 10 h Average km/ride: 92 km	Jan 2005
Number of cs parking place	16	Jan 2005
CS users allocation for age brackets	see C2.5 paragraph	Jan 2005 and Jun 2005
CS users allocation for job	see C2.5 paragraph	Jan 2005 and Jun 2005
Geographical distribution of cs users	see C2.5 paragraph	Jan 2005 and Jun 2005
Number of cs rides	496 385	Jan 2005 Average of first 7 months of the service

Table 2: Baseline data and dates about indicators.

C1.3 Building the business-as-usual scenario

We have to underline that during the Caravel period the trend of the cs service has been influenced by 3 main factors:

- the great activity relating to the promotional campaigns;
- the expansion of the number of cs vehicles;
- the expansion of the number of cs parking places.

So to understand the characteristics of the "business-as-usual" scenario it has been done the following hypothesis: without Caravel project the local operator, Genova Car Sharing, would have expanded the service but in a smaller measure and in a different way (for example, he would have considered zones not with low demand). The percentage of the reduction of the service about the number of vehicles and parking places without Caravel has been supposed by the help of the Genoa Car Sharing Manager (as some other data).
See the table below about the results of the business-as-usual scenario with some explanation (in "notes") about the way of calculation for each indicator. If it isn't possible to suppose some indicator in this scenario in the "notes" there is the reason.
In the table there are also the indicators calculated on September 2008 (or calculated at the end of the project) because it has been considered as base to create the "business as usual scenario". The explanation of the results on September 2008 (that isn't the purpose of this paragraph) is in the C2 Section.

Indicator	September 2008	Business as usual scenario	Notes about the business as usual scenario
User number	1820	1638	It has been considered 10% as percentage reduction (by GCS interview).
Number and kind of cs vehicles	98 vehicles at the end of the project (58 economy ,	60 vehicles (36 economy, 18 utility, 6 cargo)	It has been considered a reduction of 48 vehicles (by GCS interview)

Indicator	September 2008	Business as usual scenario	Notes about the business as usual scenario
(economy, utility, cargo)	29utility , 11 cargo) 73 vehicles on September 2008 (39 economy, 27 utility, 7 cargo)		The proportion between the vehicle types is the same of the 98 vehicles at the end of the project.
km and hours covered	88.678 km/month 8.973 h/month	79.810 km/month 8.075 h/month	It has been considered a reduction of 10% (by GCS interview)
% of use of cs fleet	17% (24% on August 2008)	27%	By GCS interview. The result depends from the use of the service even in the low demand zones: without this use the % of use of cs fleet would be greater.
Pro-capite use (for each cs user)	49 km/user month 5 h/user month 0,74 rides/ user month	49 km/user month 5 h/user month 0,74 rides/ user month	By GCS interview. There would be no particular changes.
Km driven by each cs vehicles	1.215 km/car month	1.330 km/car month	It's the ratio calculated using the data of kms/month covered and n° of vehicles in the usual scenario.
CS vehicle fuel efficiency	urban/suburban/mixed Economy: 7,1/4,8/5,6 Utility: 10,4/6,6/8 Cargo: 13,1/9,1/10,7 [litre/100km*vehicle] The result is about all the cs fleet at the end of the Caravel project	urban/suburban/mixed Economy:4,4/3,0/ 3,5 Utility: 6,4/4,1/5,0 Cargo: 7,2/5,0/5,9 [litre/100km*vehicle]	Calculated by ARE Liguria considering a cs fleet of 36 economy cars, 18 utility cars, 6 cargo.
Awareness level	spontaneous: 69% total (stimulated answer): 89%	-	This indicator comes from a direct survey to citizen, so it's no possible to have a "business-as-usual" scenario. Probablv without the promotional campaign done during the Caravel period the % of awareness level would have been smaller .
Acceptance level of the service	41%	-	This indicator comes from a direct survey to citizen, so it's no possible to have a "business-as-usual" scenario.
Vkm by cs vehicle type	economy: 1190 km/month utility: 1254 km/month cargo: 1202 km/month considering 73 vehicles on September 2008 (39 economy, 27 utility, 7 cargo).	economy: 1303 km/month utility: 1373 km/month cargo: 1316 km/month	The proportion between the vehicle types is the same of the 73 vehicles on September 2008.
% of mobility satisfied by car sharing	0,17%	0,22%	The result has been obtained considering a reduction of 30% of cs parking zone without

Indicator	September 2008	Business as usual scenario	Notes about the business as usual scenario
			Caravel
User's change in mobility behaviour	see C2.5 paragraph		This indicator doesn't change in the "business-as-usual" scenario.
Effectiveness of the service	see C2.5 paragraph		This indicator doesn't change in the "business-as-usual" scenario.
Evaluation of the revenue from the service	61,68 €/user 1.110,42 €/car		It's no possible to have a "business-as-usual" scenario for this indicator because there are too much hypothesis to do.
Evaluation of the cost from the service	Considering only the direct costs: 31,54 €/user 667,47 €/car Considering the total costs: 58,37 €/user 1235,32 €/car		It's no possible to have a "business-as-usual" scenario for this indicator because there are too much hypothesis to do.
Evaluation of the cost of the measure and of the attainment of breakeven point	<u>Considering only the direct costs</u>: Breakeven point cars: 98 Use: 32% per 24h subscriptions: 2.000 rides/user month: 1,6 revenue/ride: 60 € (VAT included) Average ride: 7,5 h Average km/ride: 70 km <u>Considering the total costs:</u> Breakeven point cars: 114 Use: 25% per 24h subscriptions: 2.500 rides/user month: 1,1 revenue/ride: 59 € (VAT included) Average ride: 6 h Average km/ride: 67 km		It's no possible to have a "business-as-usual" scenario for this indicator because there are too much hypothesis to do.
Number of cs parking places	52 at the end of Caravel project	37	The result has been obtained considering a reduction of 30% of cs parking zone without Caravel (by GCS interview).
CS users allocation for age brackets	see C2.5 paragraph	-	This indicator doesn't change in the "business-as-usual" scenario.
CS users allocation for job	see C2.5 paragraph	-	This indicator doesn't change in the "business-as-usual" scenario.
Geographical distribution of cs users	see C2.5 paragraph	Without Caravel the service wouldn't have covered the low	By GCS interview

Indicator	September 2008	Business as usual scenario	Notes about the business as usual scenario
		demand zones (for example, the east zone of Genoa)	
Number of cs rides	1.345	1.210	The result has been obtained considering the data coming from the "business-as-usual" scenario (the reduction of cs users per 0,74 rides/ user month).

Table 3: Business-as-usual-scenario.

In general, summarizing the results coming from the table above the local operator, without the Caravel project and following a "business thinking", would have expanded the service in a smaller measure. So the service would have covered the Genoa territory with only 60 vehicles (instead of 98 → reduction of 39%) and 37 parking zones (instead of 52→ reduction of 30%). Despite these data probably the users would be decreased only of a 10% (GCS interview), because the reduction of parking places would have concerned the areas with low demand. Of course the % of mobility satisfied by car sharing (ratio between number of car sharing rides and trips generated by private/public vehicles from areas with cs parking spaces) would be grater because the number of parking zones would be smaller (-30%) and the cs rides would decrease only of 10% (the same trend of users).
About the kms covered in a month with a cs vehicle, the trend would follow the same trend of users. Considering also that the type of vehicles would be as number proportional to the actual number (GCS interview) it means that the energy/environmental indicators (as the CS vehicle fuel efficiency) would improve of about 10%.
In conclusion, the "business as-usual-scenario" tell us that without the Caravel project the business of the local operation would be improved, but the positive energy/environmental effects coming from these type of service would have been reduced.

C2 Measure results

The areas of car sharing indicators are: transport, energy, society and economy. The results of the 16 indicators are presented above per area.

C2.1 Economy

About the baseline (January 2005), the revenue from the service is 62,94 €/user and 1.514,47 €/car. The direct cost coming from the service is 18,81 €/user and 452,71 €/car; the total cost (direct cost + indirect cost) is 58,86 €/user and 1272,12 €/car. According to these data the breakeven point is reached with these results:

- cars: 65
- use: 49% per 24h
- subscriptions: 1.600
- rides/user month: 1,6
- revenue/ride: 50 €
- average ride: 10 h
- average km/ride: 92 km.

With the data of September 2008 we can verify as the economic situation is changed. So the revenue from the service is 61,68 €/user and 1.110,42 €/car. Considering only the direct costs the amount is 31,54 €/user and 667,47 €/car. Considering the total costs we have 58,37 €/user and 1235,32 €/car. According to these data the breakeven point is reached with these results:

- **Considering only the direct costs**

Breakeven point

cars: 98
Use: 32% per 24h
subscriptions: 2.000
rides/user month: 1,6
revenue/ride: 60 € (VAT included)
Average ride: 7,5 h
Average km/ride: 70 km

- **Considering the total costs**

Breakeven point
cars: 114
Use: 25% per 24h
subscriptions: 2.500
rides/user month: 1,1
revenue/ride: 59 € (VAT included)
Average ride: 6 h
Average km/ride: 67 km

In comparison with the baseline data the revenue per user and car is a little bit decreased and the unitary costs are around the same. The revenues calculated per user cover the costs; on the contrary the revenues calculated per car don't cover the costs. The economic management of the local operator in the actual situation doesn't reach the breackeven point.

C2.2 Energy

In this area there is only one indicator: the vehicle fuel efficiency calculated per type of vehicle (Economy, Utility, Cargo) and per type of zone (urban/suburban/mixed).

BASELINE			
Vehicle fuel efficiency			
Consumption per 100 km [l/100km*v]	**Vehicle fuel efficiency [MJ/(v*km)] URBAN**	**Vehicle fuel efficiency [MJ/(v*km)] SUBURBAN**	**Vehicle fuel efficiency [MJ/(v*km)] MIXED**
Economy: 8,4/5,6/6,6	3,40	2,26	2,67
Utility: 11,9/7,5/9,1	4,81	3,03	3,68
Cargo: 11,9/7,6/9,2	4,81	3,07	3,72

Table 4: Vehicle fuel efficiency indicator (baseline date - 2005).

Considering the extension of the vehicles fleet of 2006, here are the results.

2006			
Vehicle fuel efficiency	**Vehicle fuel efficiency [MJ/(v*km)] URBAN**	**Vehicle fuel efficiency [MJ/(v*km)] SUBURBAN**	**Vehicle fuel efficiency [MJ/(v*km)] MIXED**
Economy: 8,2/5,5/6,4	3,32	2,22	2,61
Utility: 10,9/6,9/8,4	4,44	2,82	3,41
Cargo: 12,8/8,8/10,4	5,19	3,55	4,21

Table 5: Vehicle fuel efficiency indicator (2006).

Considering the extension of the vehicles fleet of 2007, here are the results.

2007			
Vehicle fuel efficiency	**Vehicle fuel efficiency [MJ/(v*km)] URBAN**	**Vehicle fuel efficiency [MJ/(v*km)] SUBURBAN**	**Vehicle fuel efficiency [MJ/(v*km)] MIXED**
Economy: 7,7/5,2/6,1	3,15	2,12	2,49
Utility: 10,8/6,9/8,3	4,41	2,79	3,38
Cargo: 12,9/8,9/10,5	5,23	3,60	4,26

Table 6: Vehicle fuel efficiency indicator (2007).

Considering the extension of the vehicles fleet of 2008, here are the results.

2008			
Vehicle fuel efficiency	**Vehicle fuel efficiency [MJ/(v*km)] URBAN**	**Vehicle fuel efficiency [MJ/(v*km)] SUBURBAN**	**Vehicle fuel efficiency [MJ/(v*km)] MIXED**
Economy: 7,1/4,8/5,6	2,92	1,97	2,31
Utility: 10,4/6,6/8	4,23	2,69	3,25
Cargo: 13,1/9,1/10,7	5,30	3,68	4,34

Table 7: Vehicle fuel efficiency indicator (2008).

See the diagram below on vehicle fuel efficiency per type of vehicle (Economy, Utility, Cargo) and about mixed zones.

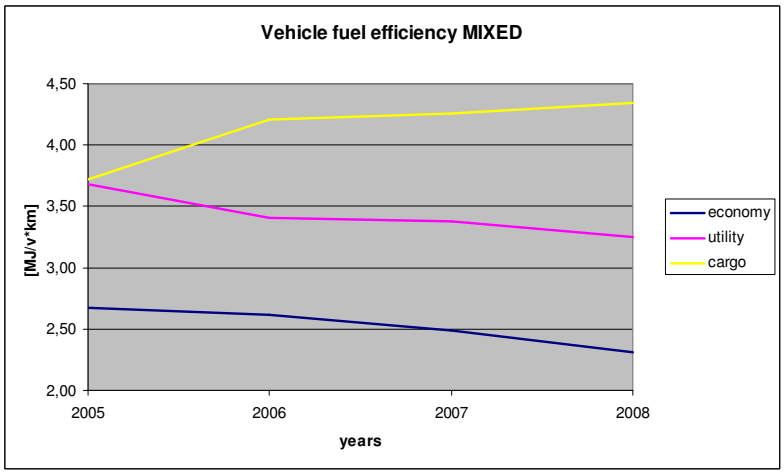


Figure 13: Vehicle fuel efficiency about mixed zones.

Variations in indicator values depend primarily on the different composition of the vehicle fleet from one year to the other.
An increase in number of less energy-consuming vehicles provokes a decrease in the average consumption of the fleet as expressed in MJ/km and in l/km.
Vice versa, as far as the cargo vehicles is concerned, there was an increase in the number of more energy-consuming vehicles, that provokes inevitably an increase also in the average consumption as expressed in MJ/km and in l/km. We underline that Ducato is a particular vehicle and provides a different user demand in comparison to the other ones, so the choice to buy this type of vehicle should separately be considered about fuel consumptions.

C2.3 Environment

There aren't indicators in this area.

C2.4 Transport

In this area there are ten indicators.

User number

At baseline (January 2005) the CS users were 417 (per a month); on September 2008 the users were 1820. Here is a diagram about the users number state of car sharing in Genoa. As we can see there is a growing trend.

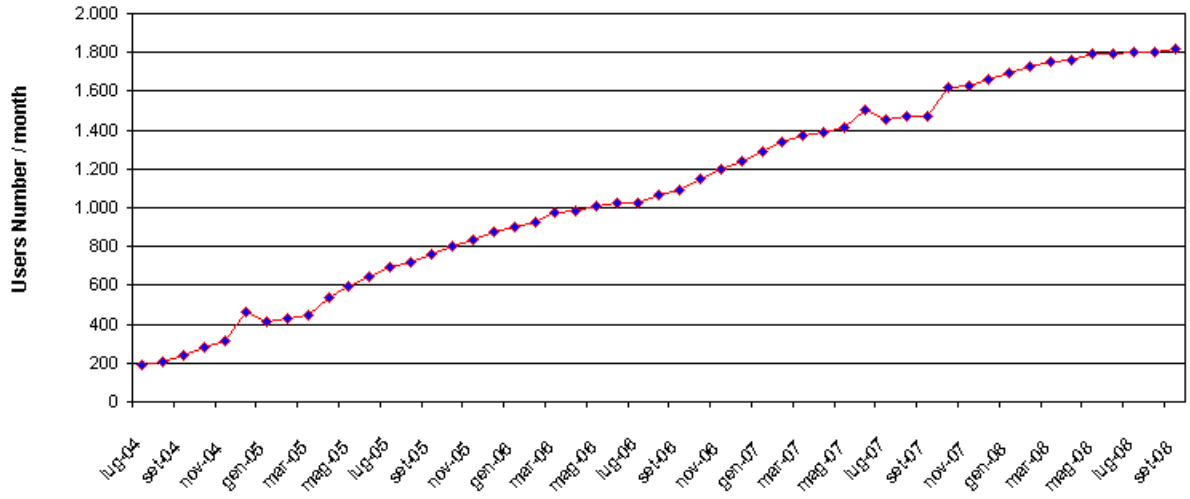


Figure 14: State of users number of car sharing in Genoa.

Number and kind of car

At baseline (January 2005) there were 8 economy cars, 7 utility cars and 1 cargo. Then, through the foreseen extension of the car sharing service in Genoa, on September 2008 there were 73 vehicles in the CS fleet: 39 economy vehicles, 27 utility vehicles, 7 cargo. At the end of the project we have 98 vehicles: 58 economy vehicles, 29 utility vehicles, 11 cargo. We specify that 13 vehicles (10 economy vehicles and 3 cargo) are dedicated to the "mixed CS service" and 1 utility car is for the disabled people service.

Here is a diagram about the cars number state of car sharing in Genoa.

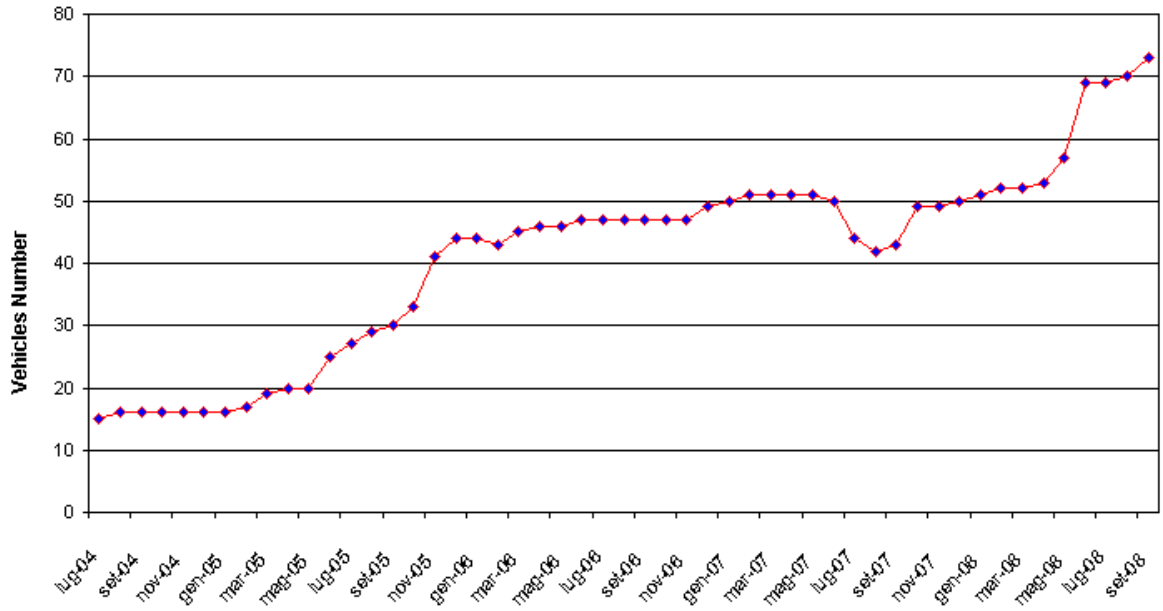


Figure 15: State of cars number of car sharing in Genoa.

km and hours

During the first seven months of the service (2004) the covered kilometers in an average month were 30.709 with 3.184 hours. As baseline we have considered the data of January 2005 with 44.049 km/month and 5.425 h/month.

On September 2008 we had 88.678 km/month and 8.973 h/month. This is consistent with the growing trend of users number. Here are the diagrams about the kms and hours covered using the car sharing service in Genoa.

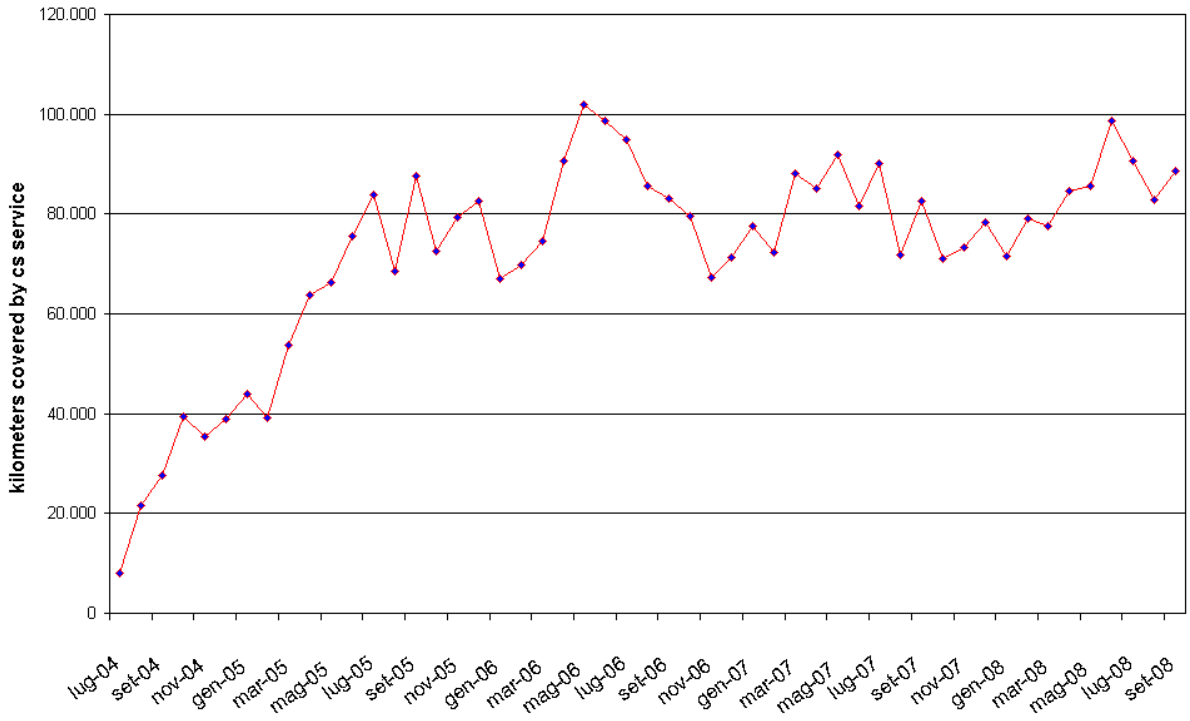


Figure 16: Trend of kms covered by car sharing service in Genoa.

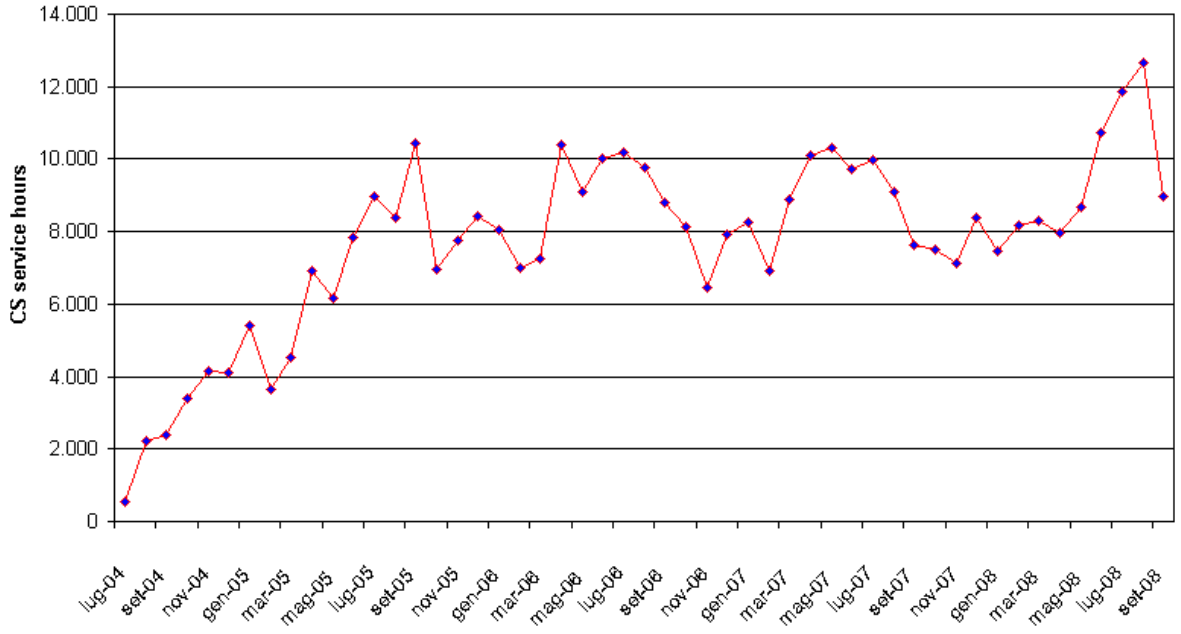


Figure 17: Trend of hours covered by car sharing service in Genoa.

% of fleet use

At baseline (January 2005) the hours/cars ratio was 45,57%; on September 2008 the ratio was 15,5% (on August was 23,6%). Here is a diagram about trend of the % of fleet use in Genoa. As we can see there has been a decrease during the Caravel period. The reason is that the cars number is grown, but the hours of CS use is increased less than the cars.

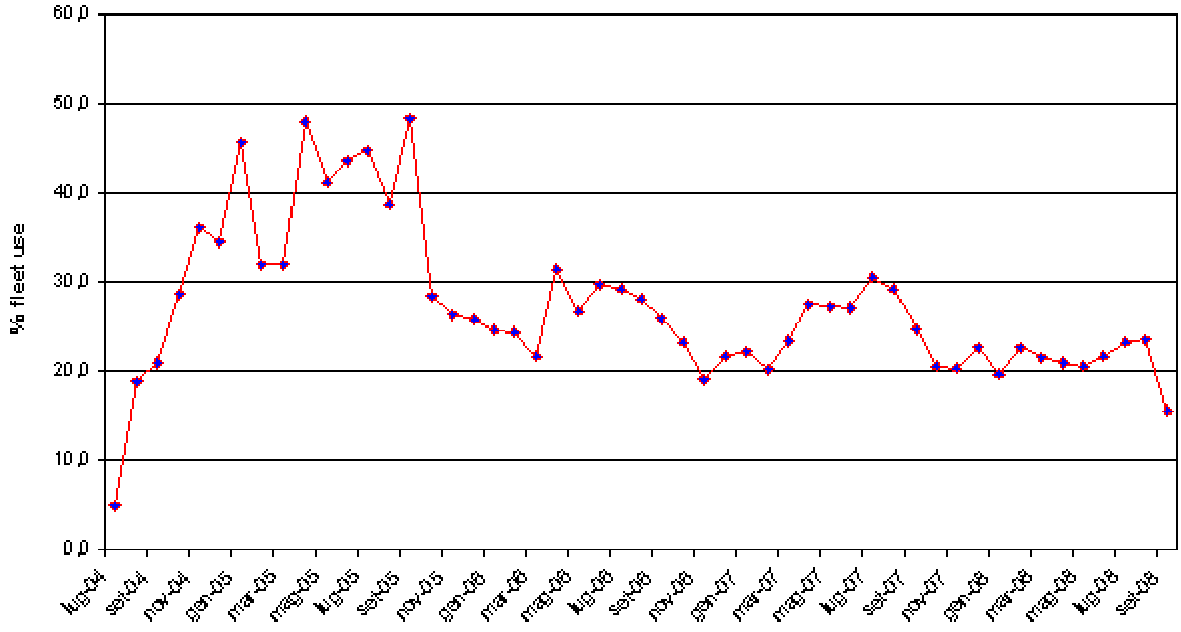


Figure 18: % of cs fleet use in Genoa.

Pro-capite use

Using the data about the first seven months of the service (2004) we monthly obtain: 102 km/user, 11 h/user and 1,28 rides/user. Using the baseline data (January 2005) we monthly obtain: 106 km/user 13, h/user and 1,19 ride/user month. On September 2008 we monthly have: 49 km/user, 5 h/user and 0,74 rides/ user. Therefore the pro-capite use is decreased. See the graphics below.

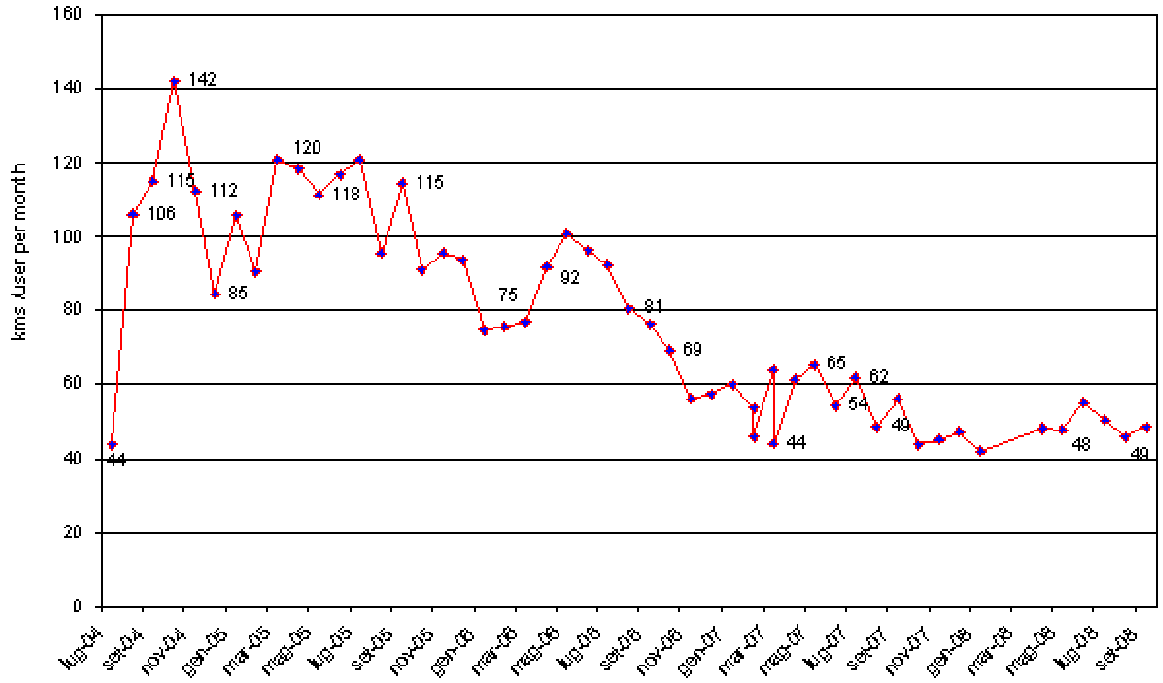


Figure 19: kms / CS user per month in Genoa.

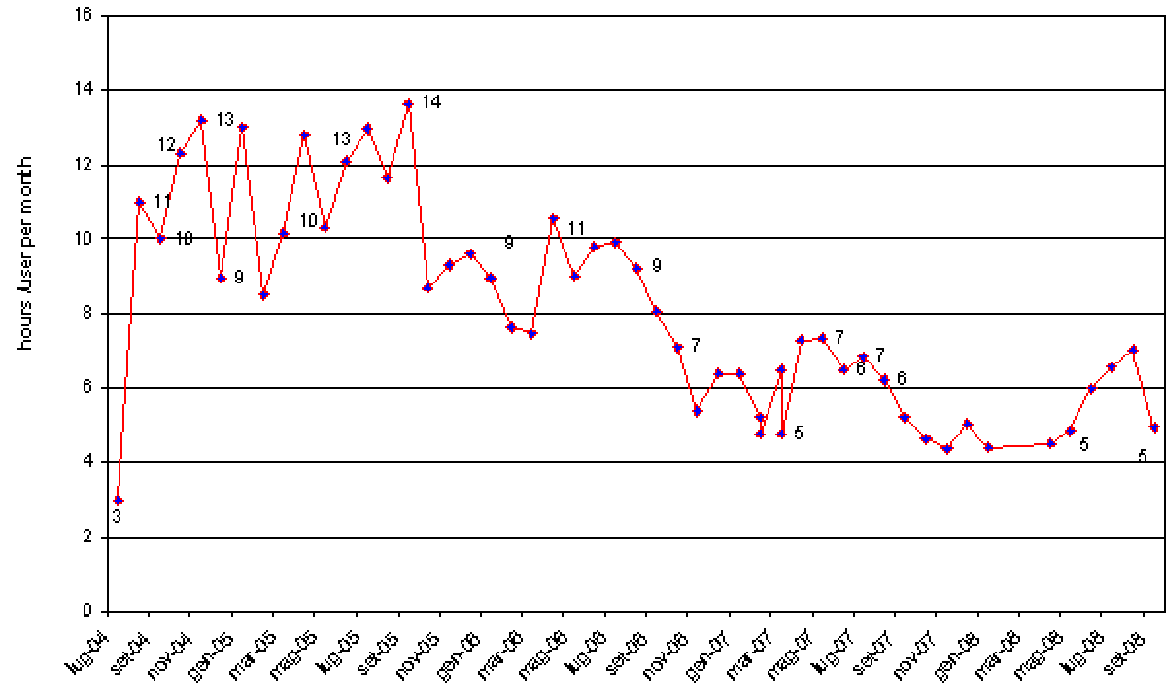


Figure 20: hours / CS user per month in Genoa.

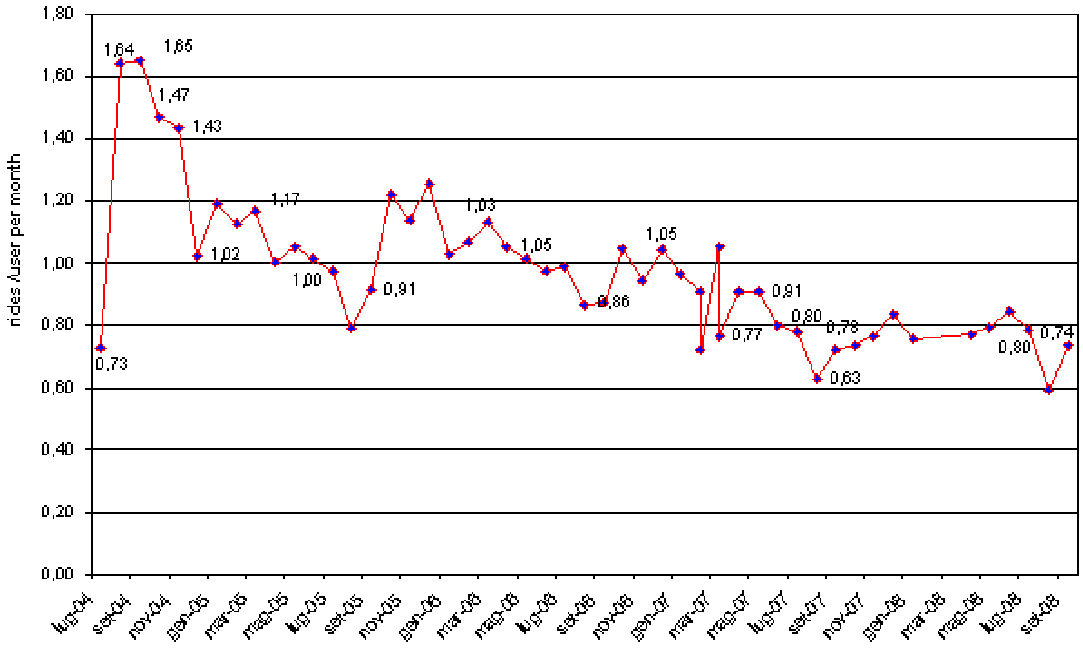


Figure 21: rides / CS user per month in Genoa.

The reason of the trend is that the users number during the Caravel project is increased a lot (+ 436%) but the user has changed his customs: for each ride he covers a minor number of kms and he uses the service for a minor time. Relating to the rides, these are increased of 271% in comparison with the baseline, therefore in a minor number in comparison with the users growth.

Km driven by each car

Using the data about the first seven months of the service (2004) we obtain 1.937 kms/car per month. On January 2005 (baseline) the kilometres monthly covered per car were 2.753 kms/car month. On September 2008 the kms/car were 1182. Therefore, observing the graphic below, the trend is decreased. The reason is that the number of cars is raised a lot (+ 456% relating to the cars available on September 2008) and the kms are raised in a minor percentage (+ 50%).

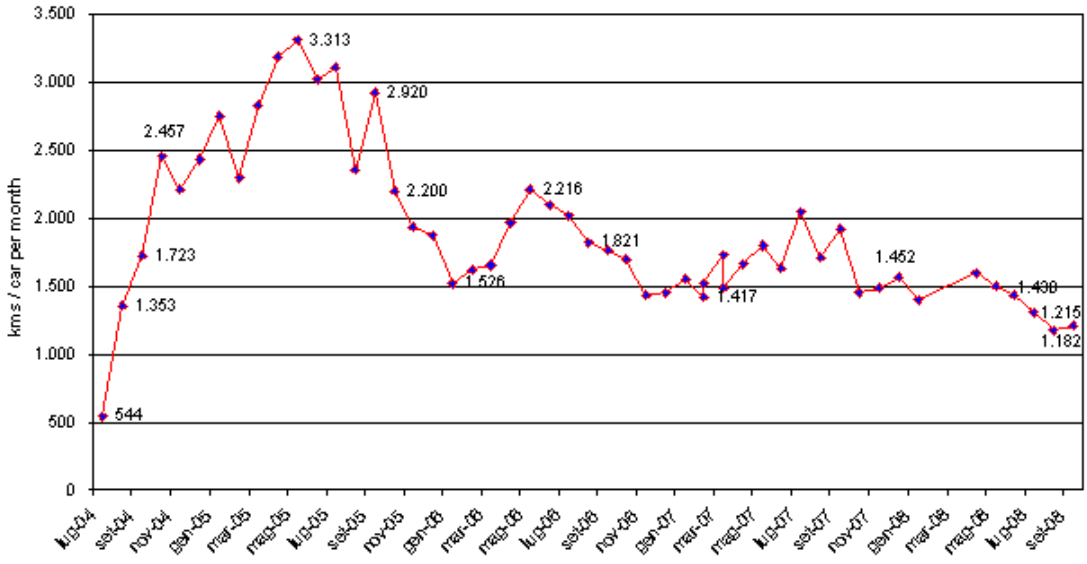


Figure 22: kms / CS vehicles per month in Genoa.

Vkm by vehicle type
As baseline the kilometres monthly covered by each vehicle type were: economy car → 2.816 km, utility car → 2.939 km, cargo → 947 km. On September 2008 the kms monthly covered were: economy car → 1.190 km, utility car → 1.254 km, cargo → 1.202 km. We can observe a reduction of kms for the economy (- 42%) and utility vehicles (- 43%). The reason is the same of that explained above in the "km driven by each car" paragraph. On the contrary, we have an increase about the kms for the cargo vehicles (+ 127%): probably this is an effect of the promotion of the van sharing service.

% of mobility satisfied by car sharing
As baseline (January 2005) the ratio between number of car sharing rides and trips generated by private/public vehicles from areas with cs parking spaces was 0,13%. On September 2008 the ratio was 0,17%. The increase from 2005 to 2008 is small because the new areas with cs parking places include also zone at low cs demand but high private car demand.

Number of parking places
As baseline (January 2005) the number of parking places is 16. According to the extension of the number of parking places the Municipality of Genoa has provided to create new parking places. So on September 2008 the parking places were 48. At the end of project the number is 52. See the diagram below.

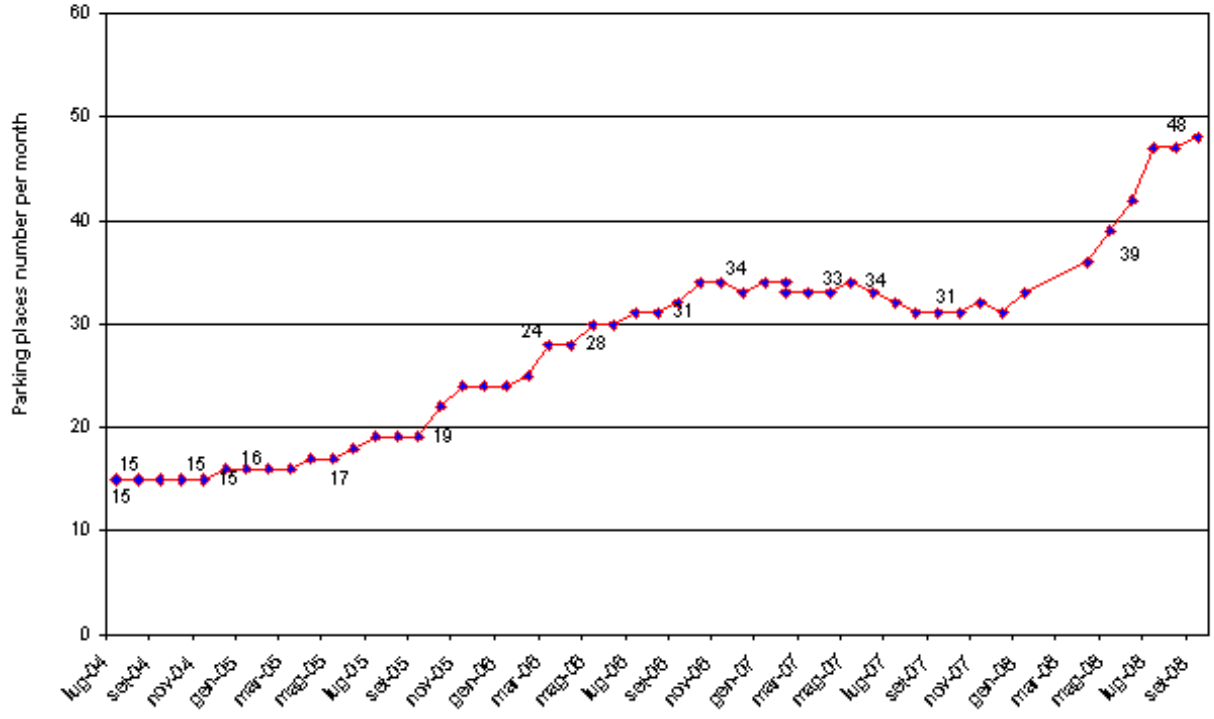


Figure 23: Monthly parking places number for car sharing service in Genoa.

Number of rides
Using the data about the first seven months of the service (2004) the CS rides were 385. Then the number is grown to 496 rides on January 2005 (baseline). On September 2008 the CS rides were 1.345. So the number is increased of 271% in comparison with the baseline. See the table below about the rides trend.

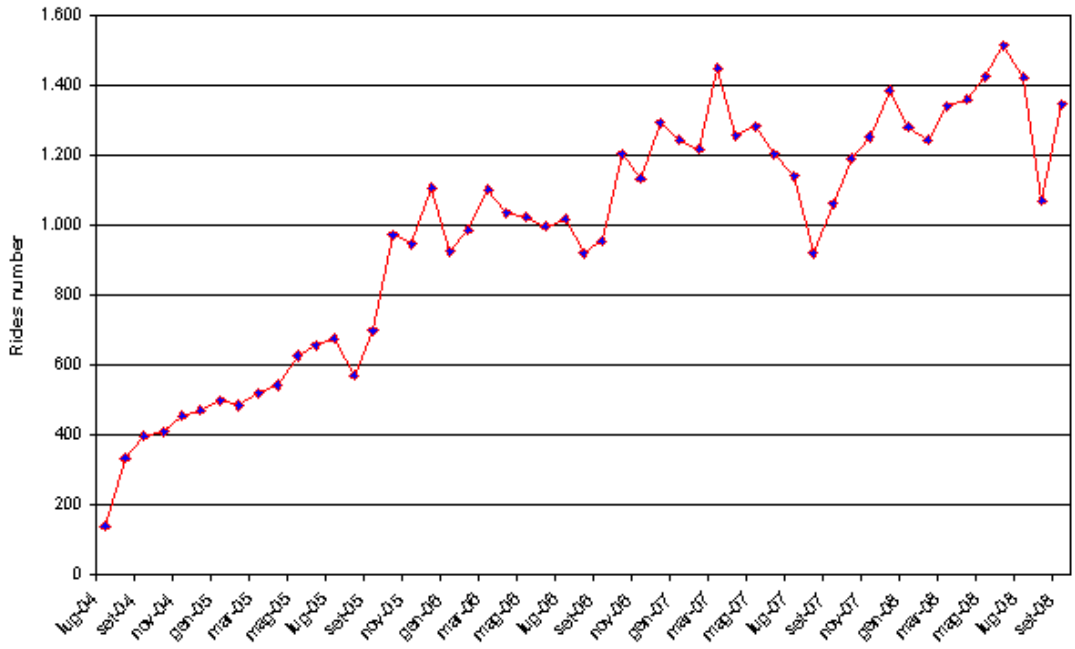


Figure 24: CS rides number per month in Genoa.

C2.5 Society

In this area there are seven indicators. In particular, by a direct survey done on September 2004 we can observe that the awareness level of the service between citizen was 54% of interviewed people (with spontaneous and certain answers); the 10,7% of interviewed people didn't know very well the service (total: 64,7%). Moreover only the 19,1% of people was ready to use the service.
On September 2008, after 4 years of car sharing service, it has been done another direct survey to understand as the society indicators are changed.
So we can observe that the awareness level of the service is increased from 54% to 69% as spontaneous answers and from 64,7% to 89% (greater awareness level between young people) as stimulated answers (this percentage includes also people that don't know very well the service): this is the effect of the important promotional campaigns done during the Caravel project.
Moreover we pass from a 19,1% to a 41% of people that is ready to use the service. See the diagram below about the comparison between the results on September 2004 and the results on September 2008.

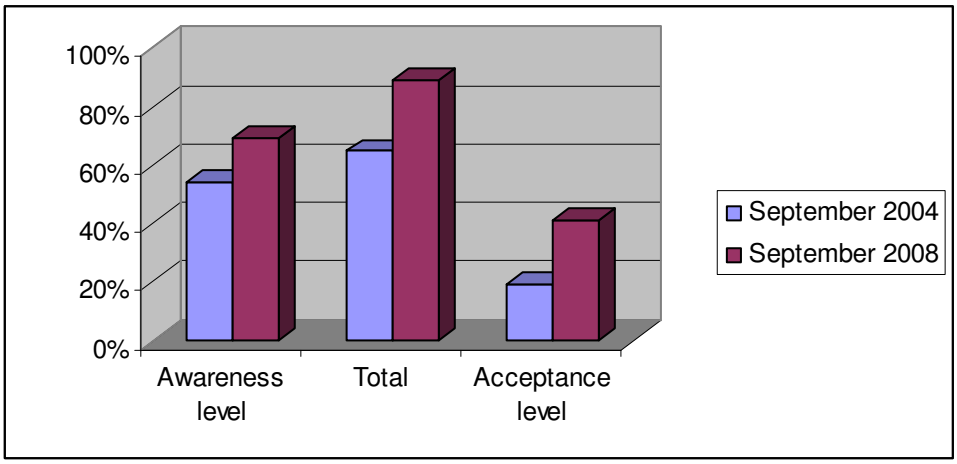


Figure 25: Awareness and acceptance level on September 2004 and on September 2008.

The CS users know the service by the possibilities described in the diagram below. It shows that the promotional campaign is very important to develope the service: the 62% of the people have known the service by advertising.

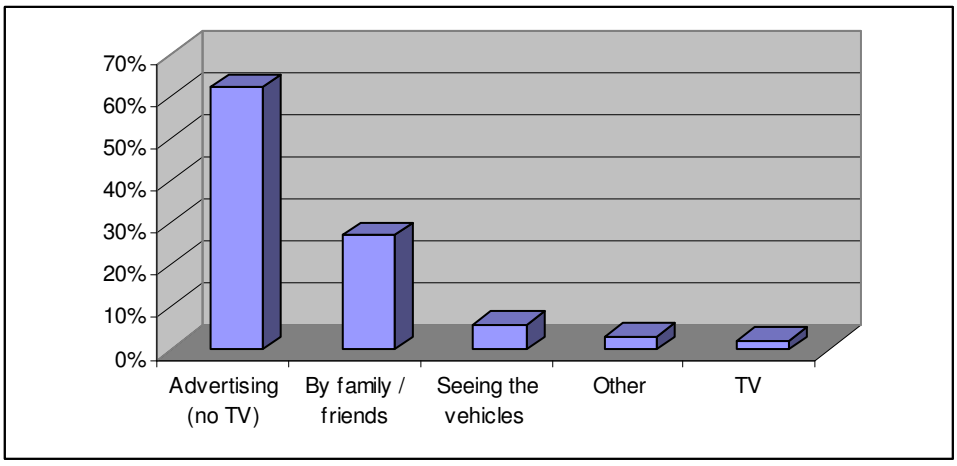


Figure 26: Awareness tools (September 2008).

About the indicator on mobility behaviour of the users of the car sharing in Italy (National data of ICS) as baseline (September 2004) see the diagrams below which are the results of a direct survey.

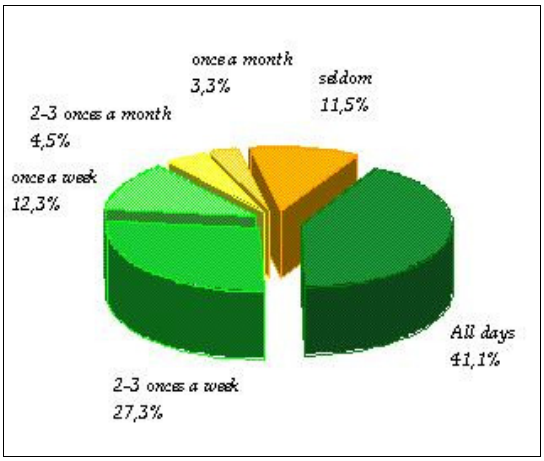


Figure 27: Mobility behaviour of the CS users relating to the private car in Italy (September 2004).

The direct survey relating to September 2008 about the mobility behaviour of the CS users in Genoa has given the results in the diagram below. We can observe that the mobility behaviour is changed: the use of the private car is decreased a lot (from 41% to 27% of people that use the car all days).

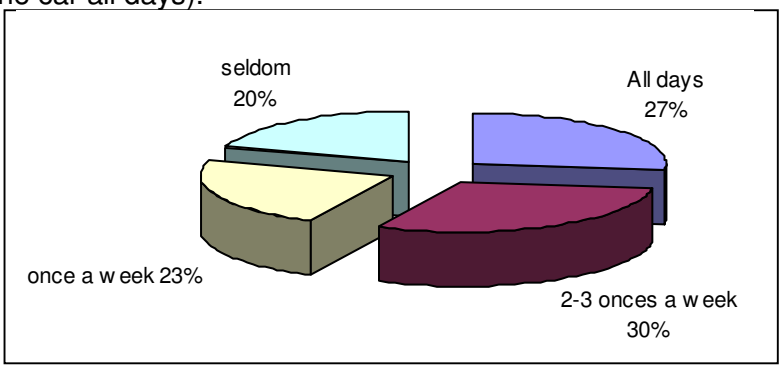


Figure 28: Mobility behaviour of the CS users relating to the private car in Genoa (September 2008).

We have calculated the average frequency in using the private car by car sharing users: 3,7 days per week on September 2004 and 2,9 days per week on September 2008.
The average kms covered per year by the private car were 14.670 on September 2004 and 11.030 on September 2008.

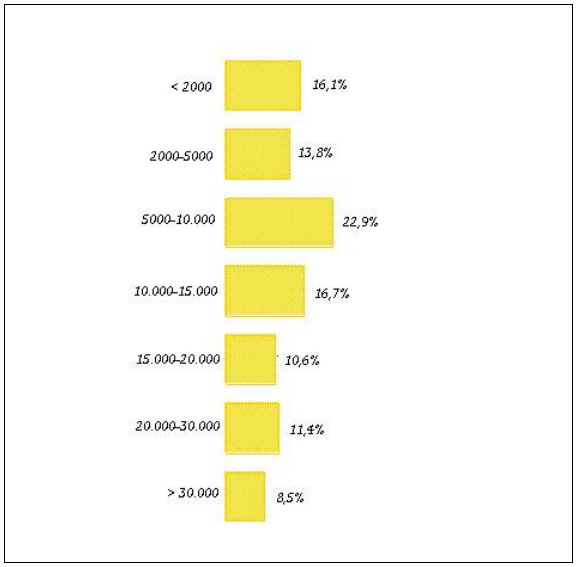
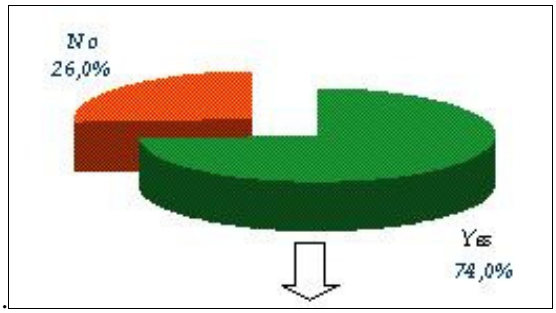


Figure 29: km covered per year by CS users (September 2004).

Moreover the 74% of car sharing users took the public transport with a average frequency of 3,6 days per week (data of September 2004).



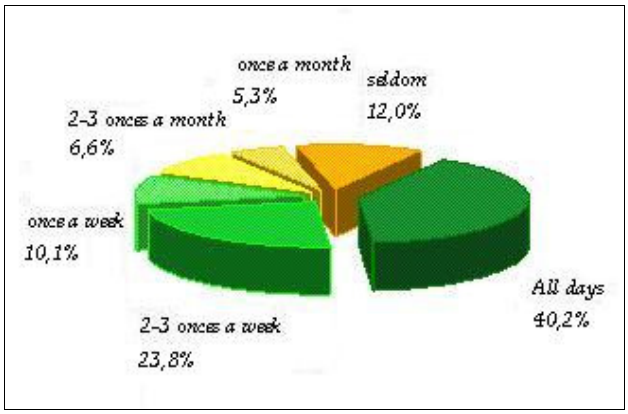


Figure 30: Use of Public Transport by CS users (September 2004).

After 4 years the mobility behaviour of the CS user is changed: people take the public transport with an average frequency of 3,4 days per week with a certain distribution as we can see in the diagram below. The 40% of users has a public transport subscription.

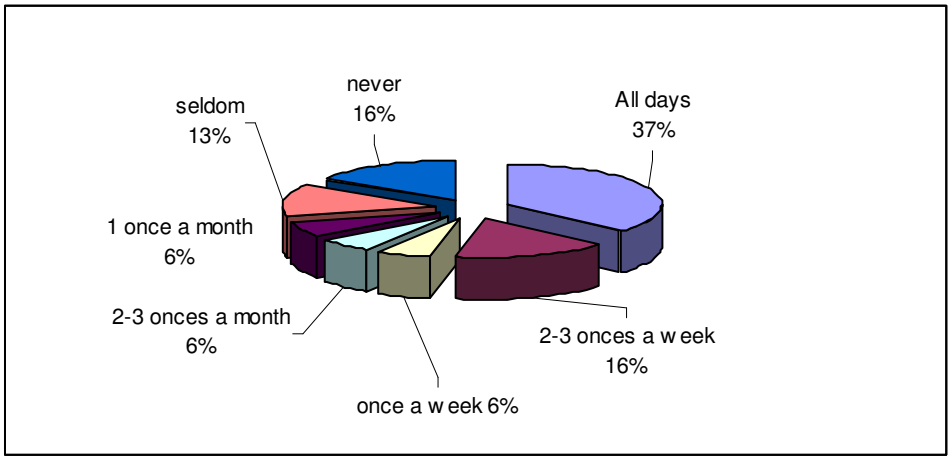


Figure 31: Use of Public Transport by CS users (September 2008).

In the table below we can see the comparison between the behaviour of car sharing users and no users one. The car sharing users reduce the use of private car but also the use of public transport: this result is the same after Caravel project.

Parametro	No user	User
Average nr. of cars per family	1,6 cars	1 car
Average use frequency of car	5,3 days/week	3,7 days/week
Average km per year	16.362 km	14.670 km
Average km in the week-end	61 km	97 km
% Use of Public Transport	74%	51,8%
Average use frequency of Public Transport	2,5 days/week	3,6 days/week
Average nr. of Public Transport subscriptions	1,3 sub.	1,2 sub.

Table 8: Data comparison between the behaviour of car sharing users and no users one (September 2004).

About the average number of private cars per family on September 2008 we can see the diagram below: the 59% of CS users doesn't have any car.

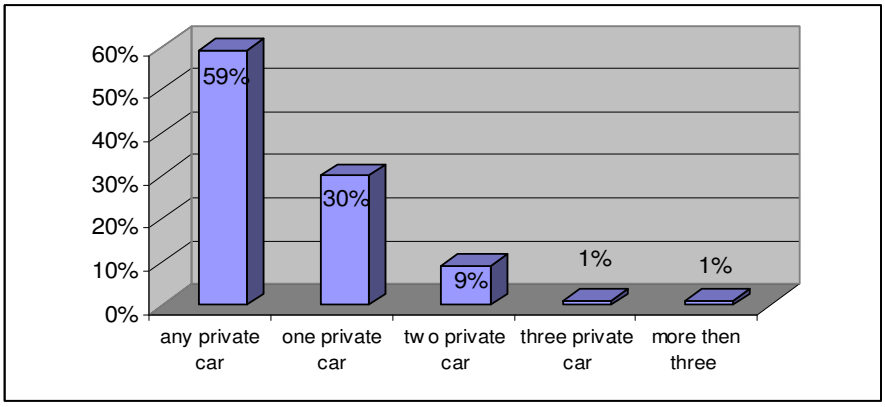


Figure 32: Number of private cars per cs family (September 2008).

About the indicator on the effectiveness of the service see the diagrams below.
The reasons of agreement to the car sharing are here illustrated. In general, the reason are:

- shortage of cars (33,3 % on September 2004, 39% on September 2008);
- use convenient (26,1 % on September 2004, 16% on September 2008).

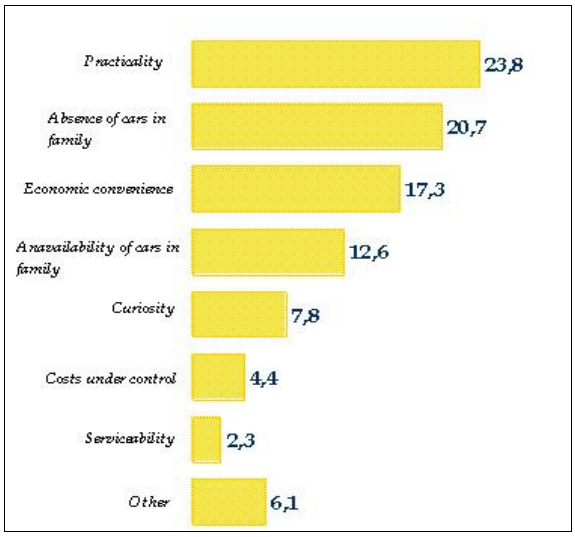


Figure 33: The reasons of agreement to the car sharing service (% - September 2004).

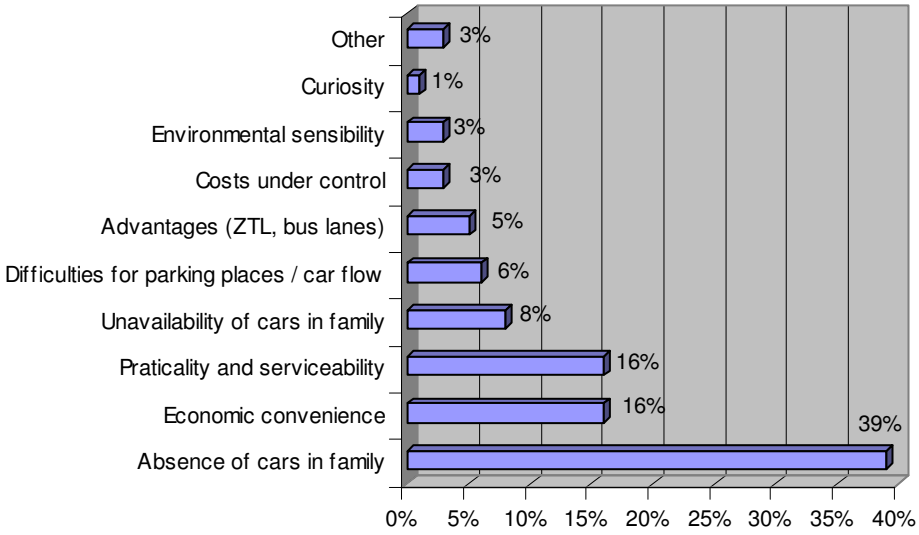


Figure 34: The reasons of agreement to the car sharing service (% - September 2008).

The diagram below shows as the users is satisfied according to the importance of some aspects (for example, the rate level , the parking spaces accessibility, service assistance etc.)

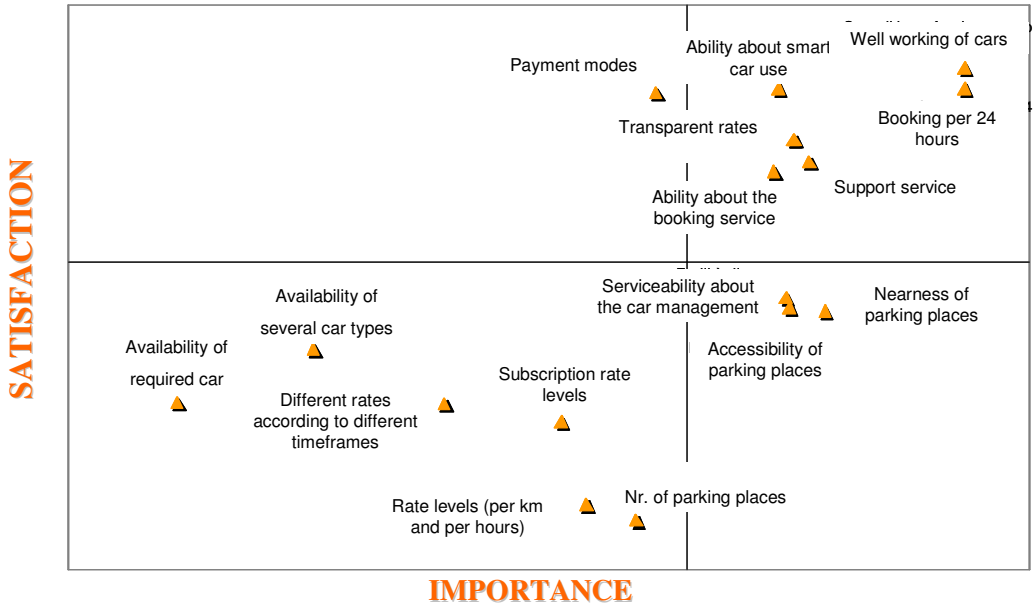


Figure 35: Satisfaction / Importance level.

About the fruition of the service and the private car see the graphic below. The shopping and free time are the most important aims to use the CS service (39% and 57%) and the private car (26% and 43%).

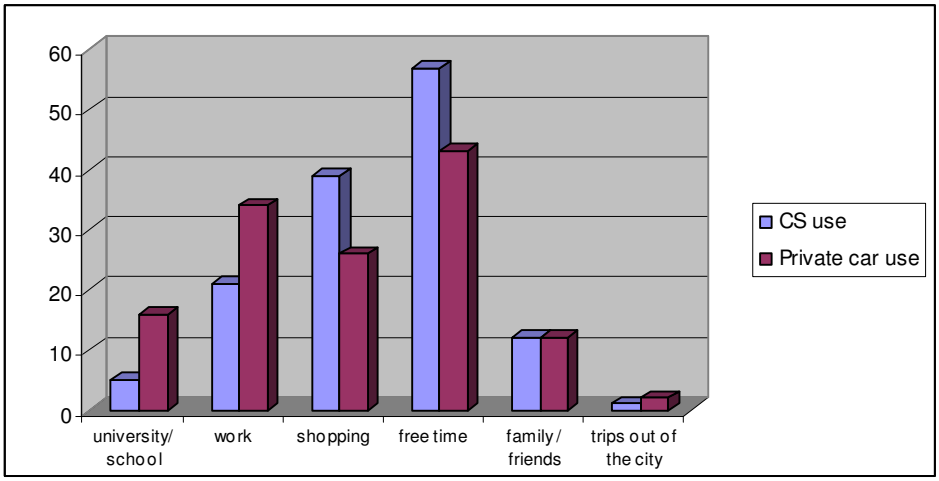


Figure 36: Fruition of the CS service and the private car (September 2008).

About the indicator on users allocation for age brackets in Genoa see the diagrams below as baseline, respectively related to January 2005 and June 2005. We underline that the results don't change on September 2008.
The result is that people 25 – 40 years old represent the 38-39% of car sharing users. People with an age under 25 isn't so interesting in the service.

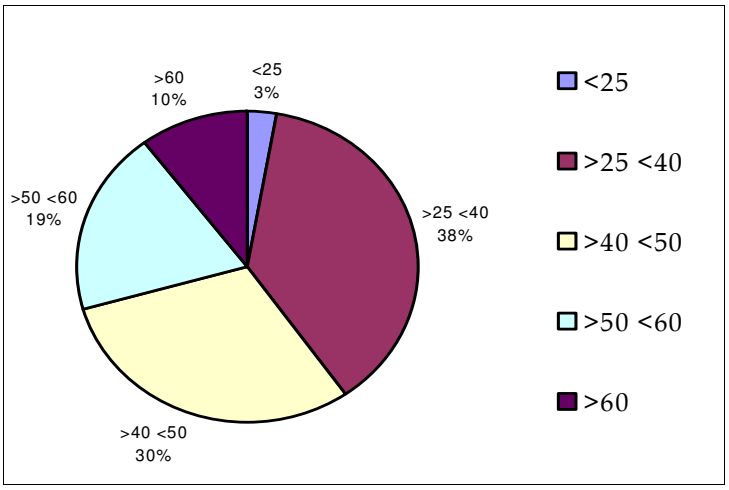


Figure 37: Users allocation for age brackets in Genoa (January 2005).

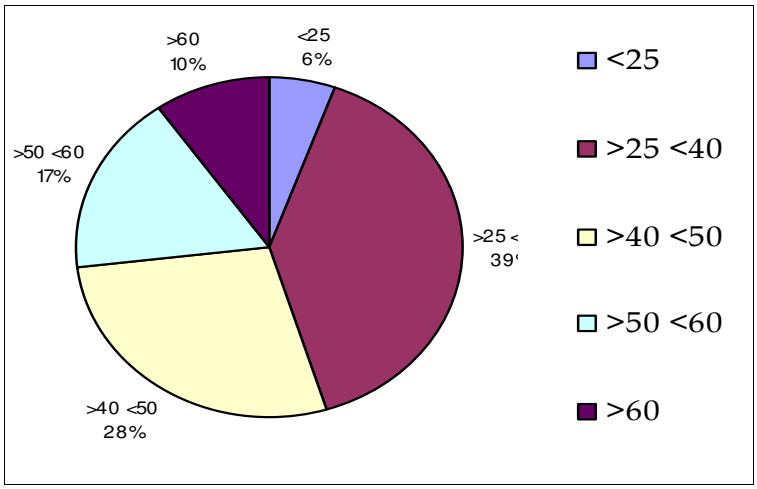


Figure 38: Users allocation for age brackets in Genoa (June 2005).

About the indicator on users allocation for job in Genoa see the diagrams below as baseline, respectively related to January 2005 and June 2005. The employers and self - employed worker represent the 70 % of total. The results don't change on September 2008.

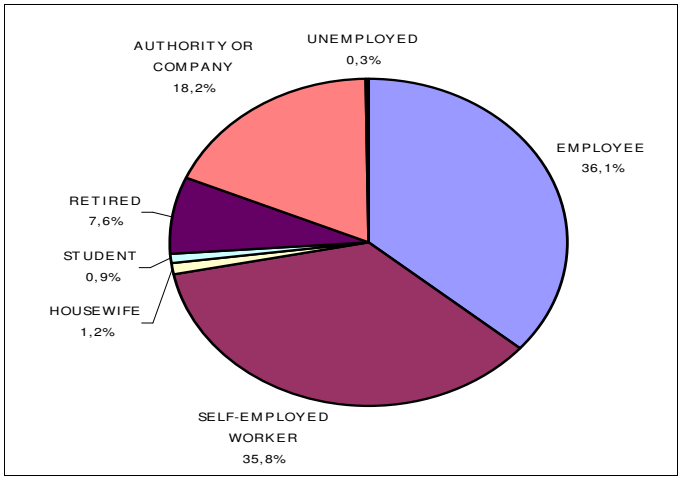


Figure 39: Users allocation for job in Genoa (January 2005).

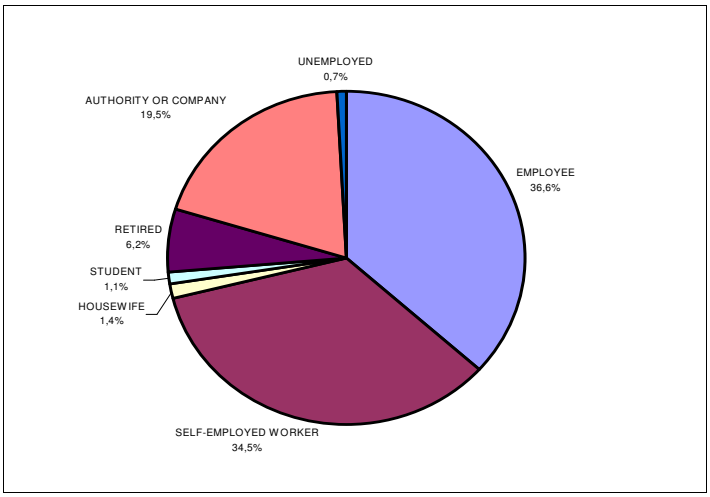


Figure 40: Users allocation for job in Genoa (June 2005).

About the indicator on geographical distribution of car sharing users in Genoa see the tables below as baseline, respectively related to January 2005 and June 2005. The historic centre has the greater number of users and the business users represent only the 26% of the total.

USERS ACQUIRED ANALISYS		
01/01/2005		
ZONES OF BELONGING		
	Numbers	%
CENTRO STORICO	89	26%
CASTELLETTO	49	15%
CARIGNANO	24	8%
CENTRO	30	8%
FOCE	14	5%
S. FRUTTUOSO	11	3%
SAMPIERDARENA	11	3%
APPARIZIONE	9	2%
LAGACCIO	8	2%
MARASSI	7	2%
ALBARO	5	2%
CAMPASSO	4	1%
FEGINO	4	1%
RIVAROLO	6	1%
FEGINO	4	1%
STURLA	3	1%
BORGORATTI	3	1%
STAGLIENO	3	1%
MOLASSANA	5	1%
S.MARTINO	2	1%
OREGINA	2	1%
PRINCIPE	3	1%
BORZOLI	2	1%
SESTRI PONENTE	2	1%
QUINTO	2	0%
NERVI	1	0%
PRA'	1	0%
BOLZANETO	1	0%
FUORI COMUNE	21	6%
ALTRI	18	6%
	344	**100%**
FAMILY	254	**76%**
Employee Municipality of Genoa	*16*	
Subscribing AMT	*33*	
Other Conventions	*10*	
BUSINESS *(P.Iva)*	85	**23%**
NGS	*2*	
PUBLIC BODIES	5	**1%**

USERS ACQUIRED ANALISYS		
30/06/2005		
ZONES OF BELONGING		
	Numbers	%
CENTRO STORICO	173	29%
CASTELLETTO	81	13%
CARIGNANO	40	7%
CENTRO	46	8%
FOCE	31	5%
S. FRUTTUOSO	15	2%
SAMPIERDARENA	20	3%
APPARIZIONE	12	2%
LAGACCIO	17	3%
MARASSI	18	3%
ALBARO	9	1%
CAMPASSO	6	1%
FEGINO	4	1%
RIVAROLO	10	2%
FEGINO	6	1%
STURLA	5	1%
BORGORATTI	7	1%
STAGLIENO	4	1%
MOLASSANA	6	1%
S.MARTINO	4	1%
OREGINA	8	1%
PRINCIPE	8	1%
BORZOLI	2	0%
SESTRI PONENTE	2	0%
QUINTO	5	1%
NERVI	2	0%
PRA'	2	0%
BOLZANETO	1	0%
FUORI COMUNE	36	6%
ALTRI	21	3%
	601	100%
FAMILY	428	**71%**
Employee Municipality of Genoa	*28*	
Subscribing AMT	*62*	
Other Conventions	*122*	
Authority no profit	*3*	
BUSINESS *(P.Iva)*	173	**29%**
NGS	*17*	
PUBLIC BODIES	5	**1%**

Tables 9: Geographical distribution of car sharing users in Genoa (January 2005 and June 2005).

Now see the table about the geographical distribution of car sharing users in Genoa on September 2008: the private users represent the 71% of the total, the business users represent the 26% and the Public Bodies represent the 3% of the total. The

percentage about the family is decreased a little bit in comparison to the percentage of 4 years ago.

USERS ACQUIRED ANALISYS		
30/09/2008		
ZONES OF BELONGING		
	30/09/2008	
	Numbers	%
CENTRO STORICO	560	31%
CASTELLETTO	196	11%
CARIGNANO	108	6%
CENTRO	129	7%
FOCE	82	5%
S. FRUTTUOSO	67	4%
SAMPIERDARENA	89	5%
APPARIZIONE	12	1%
LAGACCIO	78	4%
MARASSI	39	2%
ALBARO	63	3%
CAMPASSO	15	1%
FEGINO	3	0%
RIVAROLO	16	1%
STURLA	21	1%
BORGORATTI	48	3%
STAGLIENO	11	1%
MOLASSANA	23	1%
S.MARTINO	23	1%
OREGINA	9	0%
PRINCIPE	23	1%
BORZOLI	11	1%
SESTRI PONENTE	39	2%
QUINTO	36	2%
NERVI	14	1%
PRA'	9	0%
BOLZANETO	18	1%
FUORI COMUNE	32	2%
ALTRI	39	2%
	1813	100%
FAMILY	1287	**71%**
Employee Municipality of Genoa	*48*	
Subscribing AMT	*70*	
Other Conventions	*500*	
Authority no profit	*6*	

BUSINESS *(P.Iva)*	471	**26%**
NGS	*17*	
PUBLIC BODIES	52	**3%**

Tables 10: Geographical distribution of car sharing users in Genoa (September 2008)

At the end it is very interesting analyze some society indicator about the business firms.
On September 2008 the awareness level of the service was 64% of interviewed firms, without differences between private firms and public bodies.
Each firms had 1,2 cars available for the business work. Other vehicles used for work were:

- taxi 5%
- car with refund of charges 6%
- rent cars 6%
- public Transport 44%
- train 3%
- motorbike / bicycle 14%
- private car 8%
- any car 8%
- other 8%.

The “no users” firms know the service by the possibilities described in the diagram below. The papers (43%) is the main advertising tool.

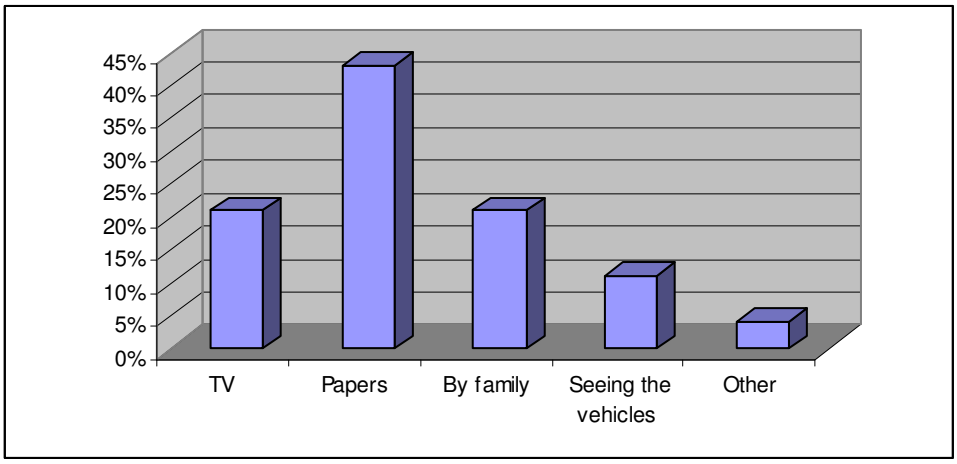


Figure 41: Awareness tools for business in Genoa (September 2008).

The “no users” firms think that the car sharing can give personnel advantages (52%) and social advantages (48%).
About the “users” firms the reasons of the CS use are illustrated in the diagram below. The most important reason is the practicality and serviceability.
Each firm have 1,2 smart cards as average value and the owner use the CS service for the 59% and the employees for the 20% of the worker total.

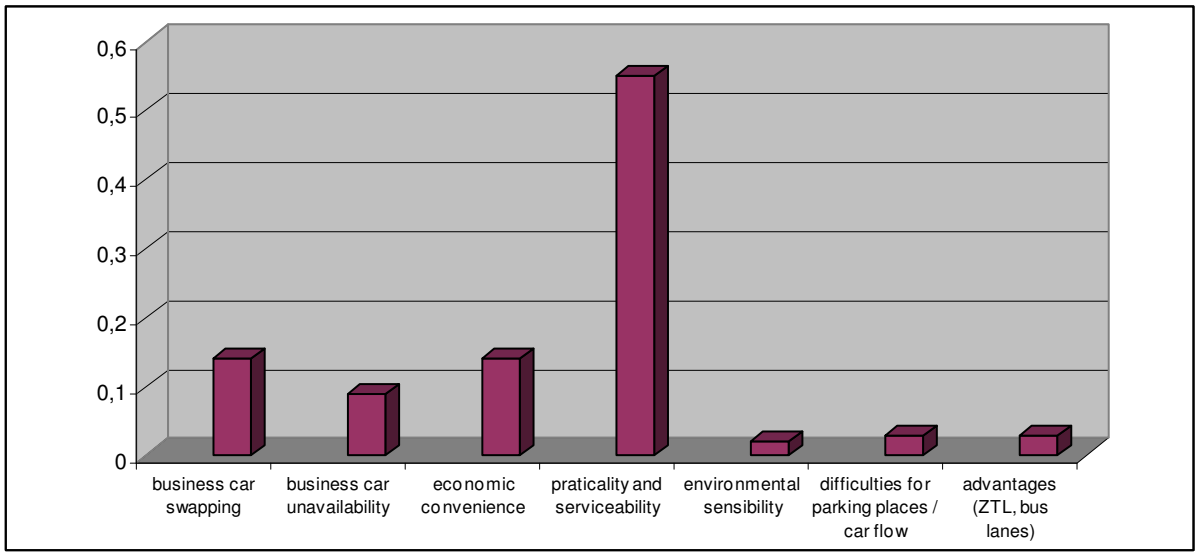


Figure 42: The reasons of agreement to the car sharing service for the business in Genoa (September 2008).

About the fruition of the service see the graphic below. The trips of the employees in the urban area are the most important aims to use the CS service (53%).

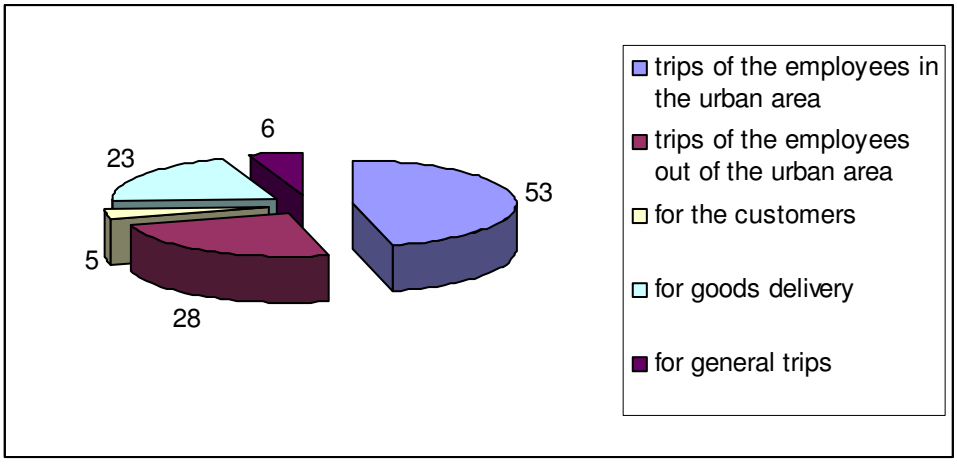


Figure 43: Business fruition of the CS service in Genoa (September 2008).

After the use of CS service the 14% of the interviewed firms have reduced the number of business cars. The satisfaction level for the service is 7,6 / 10.

C3 Achievement of quantifiable targets

No.	Target	Rating
1	Reduce the number of private cars circulating in the city by satisfying the request for mobility with this service	**
2	Use of vehicles, initially 25% of the fleet, powered by hybrid or bi-fuel engines	**
3	Raise public awareness / acceptance	**
4	Change behaviour / public awareness through new and environmentally friendly forms of vehicle use	**
NA = Not Assessed	*** = Not achieved**	****= Achieved in full** *****= Exceeded**

As explained in A1 paragraph some results have been verifiable by:

- successful gradual realisation of car sharing in Genoa with well functioning technology and satisfied users;
- to obtain about 2000 users as a result of the service in the years of the project within the relevant areas;
- better use of cars in the urban environment and reduction of the number of cars owned by the car sharing users of at least 400 cars;
- to reach at least 15% of the car sharing users as subscribers of public transport season tickets.

Concerning the second point we have just shown that the users on September were 2184 (corresponding to 1.820 user cards).
Moreover the direct survey of September 2008 has shown that the adoption of car sharing led up to a reduction of 1.050 about of circulating cars in Genoa: so each car sharing vehicle substitutes 12 private cars.
Then the direct survey has pointed out that the 40% of CS users has a public transport subscription.
In conclusion, the targets have been achieved.

C4 Up-scaling of results

This measure doesn't foresee the up-scaling of results, because one objective is already to extend the car sharing service in Genoa. We underline that the service has been launched in Genoa in July 2004 and at the starting point of the CARAVEL project the service has been carried out with a fleet of 16 cars available only in the central area of the city. In particular, the served areas were the very central ones of “Castelletto” and “Portoria” followed by “Carignano”. The measure has foreseen the extension of the service with the availability of 52 car sharing parking spaces and the use of about 98 car sharing vehicles. See the map with the areas of the extension of the service in B3.

C5 Appraisal of evaluation approach

The evaluation steps worked well. The reason is the systematic approach used to collect the data. The evaluation has taken place with a strong interrelation with similar activities under development at a national level by ICS: in fact at national level each local operator have to provide some data (as the user number, the rides/users, the kms covered and so on) to the central system of ICS. So the main work has been the interpretation of the actual indicators in comparison with the baseline data.

C6 Summary of evaluation results

The key results can be obtained comparing the indicators calculated at baseline date, at the end of the project (or on September 2008) and for the business-as-usual scenario.

Indicator	Baseline data	September 2008	Business as usual scenario
User number	417	1820	1638
Number and kind of cs vehicles (economy, utility, cargo)	8 economy , 7 utility , 1 cargo	98 vehicles at the end of the project (58 economy , 29utility , 11 cargo) 73 vehicles on September 2008 (39 economy, 27 utility, 7 cargo)	60 vehicles (36 economy, 18 utility, 6 cargo)
km and hours covered	44.049 km/month 5.425 h/month	88.678 km/month 8.973 h/month	79.810 km/month 8.075 h/month

Indicator	Baseline data	September 2008	Business as usual scenario
	30.709 km/month 3.184 h/month		
% of use of cs fleet	45,57% 27,24 %	17% (24% on August 2008)	27%
Pro-capite use (for each cs user)	106 km/user month 13 h/user month 1,19 rides/ user month 102 km/user month 11 h/user month 1,28 ride/user month	49 km/user month 5 h/user month 0,74 rides/ user month	49 km/user month 5 h/user month 0,74 rides/ user month
Km driven by each cs vehicles	2.753 km/car month 1.937 km/car month	1.215 km/car month	1.330 km/car month
CS vehicle fuel efficiency	urban/suburban/mixed Economy: (Punto): 8,4/5,6/6,6; Utility (Multipla): 11,9/7,5/9,1; Cargo (Doblò): 11,9/7,6/9,2;	urban/suburban/mixed Economy: 7,1/4,8/5,6 Utility: 10,4/6,6/8 Cargo: 13,1/9,1/10,7 [litre/100km*vehicle] The result is about all the cs fleet at the end of the Caravel project	urban/suburban/mixed Economy:4,4/3,0/ 3,5 Utility: 6,4/4,1/5,0 Cargo: 7,2/5,0/5,9 [litre/100km*vehicle]
Awareness level	spontaneous: 54,0% total (stimulated answer): 64,7%	spontaneous: 69% total (stimulated answer): 89%	-
Acceptance level of the service	19,1%	41%	-
Vkm by cs vehicle type	economy: 2.816 km/month utility: 2.939 km/month cargo: 947 km/month	economy: 1190 km/month utility: 1254 km/month cargo: 1202 km/month considering 73 vehicles on September 2008 (39 economy, 27 utility, 7 cargo).	economy: 1303 km/month utility: 1373 km/month cargo: 1316 km/month
% of mobility satisfied by car sharing	0,13%	0,17%	0,22%
User's change in mobility behaviour	see C2.5 paragraph	see C2.5 paragraph	
Effectiveness of the service	see C2.5 paragraph	see C2.5 paragraph	
Evaluation of the revenue from the service	62,94 €/user 1.514,47 €/car	61,68 €/user 1.110,42 €/car	
Evaluation of the cost from the service	18,81 €/user 452,71 €/car	Considering only the direct costs: 31,54 €/user 667,47 €/car Considering the total costs: 58,37 €/user 1235,32 €/car	
Evaluation of the cost of the measure and of the attainment of breakeven	Breakeven point: cars: 65 Use: 49% per 24h	Considering only the direct costs: Breakeven point	

Indicator	Baseline data	September 2008	Business as usual scenario
point	subscriptions: 1.600 rides/user month: 1,6 revenue/ride: 50 € Average ride: 10 h Average km/ride: 92 km	cars: 98 Use: 32% per 24h subscriptions: 2.000 rides/user month: 1,6 revenue/ride: 60 € (VAT included) Average ride: 7,5 h Average km/ride: 70 km <u>Considering the total costs:</u> Breakeven point cars: 114 Use: 25% per 24h subscriptions: 2.500 rides/user month: 1,1 revenue/ride: 59 € (VAT included) Average ride: 6 h Average km/ride: 67 km	
Number of cs parking places	16	52 at the end of Caravel project	37
CS users allocation for age brackets	see C2.5 paragraph	see C2.5 paragraph	-
CS users allocation for job	see C2.5 paragraph	see C2.5 paragraph	-
Geographical distribution of cs users	see C2.5 paragraph	see C2.5 paragraph	Without Caravel the service wouldn't have covered the low demand zones (for example, the east zone of Genoa)
Number of cs rides	496 385	1.345	1.210

Table 11: Comparison between the indicators calculated at baseline date, at the end of the project (or on September 2008) and for the business-as-usual scenario.

A lot of results have been explained in the preceding paragraphs. Here we summarize the most important of them.

Key result 1: The foreseen CS user number has been achieved. In fact a significant increase of users took place:

- 417 active contracts on January 2005,
- 1.820 active contracts (2184 users) on September 2008.

Key result 2: The number of cars has been increased from 16 to 98 during the Civitas period.

Key result 3: A good coverage of the urban area has been achieved through the improvement of car sharing parking places from 15 to 52. Many areas at low demand has been covered.

Key result 4: An average of 1.400 Kms per car are monthly driven by car sharing users (average data of the last six months).

Key result 5: The use of car sharing was introduced in the Municipality of Genoa replacing a part of the proprietary fleet, using 13 vehicles during the working days and hours, which are released and can be used by other users during the non-working hours and the weekends. On September 2008, 250.873 km have been driven on car sharing cars by the Municipality of Genoa for working purposes.

Key result 6: 10 vans has been introduced in the car sharing fleet during the Caravel period and an agreement for the use of these vehicles has been signed between the Car Sharing Operator and the Shopkeepers Associations under the patronage of the Municipality of Genoa.
Key result 7: A car has been equipped to allow disabled persons to directly drive, increasing their degree of freedom. The car can be equipped in different ways, to cover the needs of 90% about of disability. A special service scheme was set up to satisfy the specific needs on these users (car preparation and car delivery at home if required). The initiative was designed and developed with the active participation of the Associations of impaired people.

Key result 8: Many actions of promotion have been developed: street events, direct marketing activities, information campaigns on media (local radio, TV and newspapers), participation to local fairs.

Key result 9: A comprehensive evaluation of the effects of car sharing in the city mobility has been performed analyzing both quantitative and qualitative aspects of the service.

Indicators	Jan-05	Jan-06	Jan-07	Jan-08	Sept-08
users/car	26	20	26	33	25
Km/car	2.753	1.526	1.553	1.402	1.215
Km/user	106	75	60	42	49
Km/ride	89	73	62	56	66
rides/user	1,19	1,03	0,96	0,76	0,74

Table 12: Comparison between some indicators calculated in several periods.

The indicators clearly show that there is a progressive reduction of the unitary use of car which during the three years and half of observation has been reduced at the half about.

Key result 10: An important part of the Caravel measure has been the analysis of the customer satisfaction by direct surveys (September 2004 and September 2008). So some results are here summarized.

- The degree of awareness of car sharing in Genoa has reached on September 2008 the 69% of the population; about the business field the awareness level of the service has reached the 64% of interviewed firms.
- The direct survey of September 2008 has pointed out that the 40% of CS users has a public transport subscription. It means that CS service is able to addressed the users to a mobility behaviour more sustainable.
- The satisfaction of the users about the service is high: an average rating of 7,9 over 10 was given by the users (September 2008).
- The comparison between the perceived costs and benefits shows a very positive evaluation by the users: 50% thinks benefits are higher than costs and 33% thinks that they are balanced, while only 13% perceive the service as too expensive related to the benefits.

Key result 11: The direct survey (September 2008) carried out on car sharing users pointed out that the use of car sharing has reduced the km driven by car for each car sharing user of an average of 2.750 km/year about which represents the 17,2% about of the mileage driven before the adoption of car sharing.

Key result 12: Globally, with the level of use of September 2008, in Genoa there has been an overall saving of 6.000.000 kms/year (2.750 km/year saved x number of users) about with a saving of pollutants as the table in kg/year.

CO	NOx	VOC	TSP	N20	C6H6	PM10	CO2
44.410	4.182	4.867	425	164	312	384	1.066.920

Table 13: Saving of pollutants by the CS service use in Genoa [kg/year].

We underline that this environmental indicator has not been foreseen at baseline, so it doesn't appear in the indicators tables of the previous paragraphs. So now observing the table above (coming from the calculations of a specific software tool that considers the types of vehicles and the kms covered and not covered thank the CS service), we can see as the impact of the CS strategy is important to reduce the pollutants (for example, minus 1.066.920 kg/year of CO2).

Key result 13: The adoption of car sharing led up to a reduction of 1.050 about of circulating cars in Genoa; in fact (derived by on-field study) each car sharing car substitutes 12 private cars.

Key result 14: The increase in number of less energy-consuming vehicles led to a lower average consumption of the car sharing fleet: for example, it has been achieved a saving of 0,58 MJ/km per utility car circulating in the urban area. The average reduction of consumption is about 477.000 liters fuel per year.

Key result 15: Relating to the local operator point of view it's important to reach a configuration of the service (number of cars, users, rides, km coverd, etc) able to guarantee the attainment of the breakeven point. However this configuration has to keep in mind the needs of the urban mobility. For example, without Caravel project (business-as-usual-s cenario) the service wouldn't have covered the low demand zones (as the east zone of Genoa) and perhaps the local operator would reached the breakevenpoint; but the positive environmental / energy impacts of the car sharing service there would not have been on these zones.

D Lessons learned

D1 Barriers and drivers

D1.1 Barriers

- **Barrier 1** – Car sharing is a new mobility service; so the risk has been related to the response from the market to the offer of the service. The barrier has been linked to the resident people of target areas (the possible end users) and local/regional businesses. The strategy for overcoming the barrier has been the promotion of the service, the awareness raising and the support by the Municipality.
- **Barrier 2** – Acceptance of the adoption of car sharing as a mobility tool by the various offices of the Municipality of Genoa which have adopted car sharing instead

of property cars. This is a specific objective of the measure, but the risk that the measure failed due to the barrier was moderated. The barrier is linked to the local/regional administration; so the strategy for overcoming the barrier has been a direct involvement in the project of the top management of the Municipality, supporting the diffusion of the car sharing, and the exploitation of meetings and training to the personnel.

D1.2 Drivers

- **Driver 1** – The support by the Municipality and other national institution as ICS. The intensity of driving force is high.
- **Driver 2** – Local Car Sharing operator involvement in the business. The direct interest of Genova Car Sharing, that is the management operator of car sharing service in Genoa, has been very important.
- **Driver 3** – Strong promotion actions and strategies. The promotional and communication campaign for the citizens, direct marketing activities, information campaign through direct information and media had a high intensity as driving force.

D2 Participation of stakeholders

- **Stakeholder 1 –** Local / regional politicians for promotion of car sharing and requiring support from them. Car Sharing in Italy represents a marginal slice of the business for the transport companies, and this often makes it difficult to pay to it the attention that it needs. In this sense, the role of Public Local Administration has been decisive, as a stimulus for the public transport and Car Sharing operators to move ever more decisively towards integration.
- **Stakeholder 2 –** National politicians in the transportation field for a political support in introducing new legislation considering car sharing.
- **Stakeholder 3** – Local Public Transport Company for commercial cooperation and joint promotion.
- **Stakeholder 4 –** Resident people of target areas as potential car sharing users.
- **Stakeholder 5 –** Driving license disabled holders as potential car sharing users. The experiment with the use of a single car has been developed with the agreement of the associations for disabled people.
- **Stakeholder 6 -** ICS (the Association of Italian Car Sharing Operators) with a strong support. ICS coordinates the local initiatives with the general national standards and rules framework.

D3 Recommendations

Recommendation 1 – The car sharing service, as shown in the present document, is an important tool for a sustainable mobility. It means that the environmental impact on the urban mobility is really positive.

Summarizing, car sharing gives a lot of advantages to users and to the city:

- User point of view: savings in terms of money and time, free access to Restricted Traffic Areas, possibility of using reserved public transport lanes, possibility of free parking on public paying parking places, discounted access to city services (museums, theatres, etc.).
- City point of view: more urban space available to citizens with a lower use of parking places, reduction of pollution due to the decrease of driven mileage and

the high-level standards of the car sharing vehicles, new and more flexible transport services offered to the citizens.

- A new culture of mobility: diffusion of a new culture of the use of car, contribution to a more rational modal choice by the citizens, internalization of external costs of transportation.

So the measure to extend the service should be taken up by other cities (in Italy and at European Level).

D4 Future activities relating to the measure

Genova Car Sharing is the private operator created to manage the service. So in the future it wants to extend the car sharing on Genoa territory with the aim to join the greater number of users for its business.

At Italian level the car sharing is managed by ICS, a national organism which guarantees the respecting of service standards and stimulates the development of the service. ICS has the job of aiding the Municipalities and the Car Sharing service operators to plan and set up stages of the service.

So the activities relating to the measure will certainly continue after the end of CARAVEL project.