

CIVITAS

Cleaner and better transport in cities

POINTER

Cluster Report 1: Alternative Car Use

(Car Sharing and Car Pooling)

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1. INTRODUCTION

The provision of alternatives to the car is an essential component of any comprehensive strategy for transport in and around European cities. It was and remains an important element of the overall CIVITAS programme. This report illustrates the developments in sustainable car use within the CIVITAS Plus programme.

In this report, measure implementation and evaluation results have been brought together at cluster / sub-cluster levels. The main objective has been to integrate the evaluation results across the CIVITAS Programme and identify drivers and barriers which have influenced measure implementation. This report has been focussed on summarising the outcomes at a technical level. More detail is available from the individual Measure Evaluation Results Templates (MERTs) and from the process and Economic reports.

A comparison in the number of measures between CIVITAS Plus and CIVITAS II is shown in Table 1.1. As can be seen, city interest in car sharing measures has increased substantially from 8 to 12 measures. However, interest in car pooling has reduced from 8 to 2 measures.

Table 1.1 Number of measures in CIVITAS Plus and CIVITAS II

	CIVITAS II	CIVITAS Plus
Car Sharing	8	12
Car Pooling	8	2

The definitions of car sharing and carpooling applied here are:

- **Car sharing** is the practice whereby individuals hire vehicles, often for a range of purposes and usually on a time-limited basis e.g. car rental schemes and car clubs.
- **Car pooling** is the practice whereby individuals combine to share private vehicles for specific journeys.

Car sharing typically involves a group of people who share a fleet of cars by paying an annual fee and a fee for each kilometre travelled, i.e. “pay-as-you-drive” (CIVITAS Guard, 2010). Fleets are usually organised by a private company, which is often subsidised by the city or local public transport authority. Car sharing can be a very effective and sustainable mode of transport in urban areas, as they target people who have only occasional need for a car, who do not want to own a car because of the annual costs, or who live in narrow, historical city centres or areas where parking spaces are scarce or expensive. They also encourage greater walking, cycling and use of public transport by individuals. The service can be offered to companies to enable their staff to use a car for business trips, thereby avoiding the need for expensive leasing contracts or fleet ownership.

Car pooling involves two or more people, who have the same (or similar) origins and destinations at a similar time of travel, and who agree to travel together using only one car to share travel and parking costs. These schemes are particularly suited to commuters from a given area, who need to travel to/from their work place within the city on a regular basis. They can result in more sociable journeys for the participants, as well as a reduction in congestion on the network. Car pooling schemes are best established initially at companies

with a significant number of employees, as a critical mass of participants is required, and co-workers can overcome the social resistance in sharing a ride with strangers. They also benefit the companies, which can reduce the number of parking spaces and therefore the land required for such use.

To date, such alternative car use schemes continue to grow in both Europe and worldwide. For example, by October 2012, there were almost 700,000 members of recognised car sharing schemes in Europe, accounting for 39% of worldwide car sharing membership (Shaheen and Cohen 2012).

Both car-sharing and car-pooling measures can be implemented in inner suburbs, along busy corridors, and in city centres, commercial areas and district centres where there is a high density of potential users. They are also of interest to public transport operators, who can strengthen their own offering by providing ‘through fares’ or special tariffs to enable a seamless transfer between the different transport modes, or to benefit directly from the transfer and reduction in private car use.

Prior to these schemes, many other car sharing and pooling services had been implemented and evaluated previously as part of the CIVITAS I and II programmes. Among these, for example Genoa and Venice (for car sharing), and Burgos, Drebrecen, Norwich and Toulouse (for car pooling) had been identified as being particularly successful. Others such as Preston (for car sharing) and Potenza (for car pooling) were reported as not being successful at the time because a commercial partner could not be found to operate the scheme (CIVITAS Guard: Cluster Report 1: Alternative Car Use, McDonald et al., 2010). In general, the following factors have been identified as being important in implementing any car sharing or car pooling service:

- Awareness needs to be generated through information provision and a sustained marketing programme. The innovative nature of car sharing and pooling means that a significant proportion of the population are unlikely to be familiar with the concepts. Therefore, the positive benefits of participation may not be conveyed actively to all potential users, particularly the targeted membership groups.
- The schemes must engage key stakeholders and operating partners, and should be developed in a clear policy context, which integrates car sharing/pooling with wider transport policies and other operations in the city, such as parking management. Also, there should be a clear strategy for implementation, with clear objectives that match the needs of potential users as well as stakeholders and, at a business level, the schemes should be integrated into work travel planning strategies.
- The schemes must be tailored to their intended users in a professional and supportive way. This includes the provision of tools and support mechanisms that enable participants to engage readily in each scheme.
- While these schemes have the potential to make a valuable contribution to enhancing the sustainability of urban mobility, some initiatives may not be viable without financial support from the local or municipal authority - particularly those that are at an early stage and/or deploy more sustainable and expensive vehicles.
- The effects of these schemes should be monitored over the long term, to provide further understandings of their possible impacts on travel behaviour and car ownership, and to inform future developments.

2. IMPLEMENTATION

2.1 CAR SHARING

The 11 schemes of the CIVITAS Plus programme to establish or promote car sharing are reviewed below. Five of these initiatives are said to be new or an assessment of new schemes (see Tables 2.1), while six form upgrades to, or are promotions of, an existing car sharing schemes (Table 2.2).

Table 2.1 Implementation / assessment of new car sharing scheme

City	No.	Title	Measure	Comments
Brescia	M06.05	Car Sharing in Brescia	<ul style="list-style-type: none"> Introduced new car sharing scheme for Brescia, a medium sized city in Italy Aimed at all private citizens, but yearly subscription and entrance fee are discounted for employees from Ikea and public bodies, and for staff and students from the University Fleet consists of 6 vehicles (3 powered by natural gas), with 7 reserved parking spaces in the City 	<ul style="list-style-type: none"> Scheme managed through new systems and technology, including internet website and call centre for car bookings. A central system/service was used to administer the reservations, and users were given contactless cards to access vehicles (see Figure 2.1)
Coimbra	M06.03	Feasibility of New Mobility Services in Coimbra	<ul style="list-style-type: none"> Technical and economic assessment for proposed car sharing service, using literature and commercial review, and workshops and meetings with outside experts and operators Proposed scheme to complement services provided by local public transport operator, for 10 shared vehicles (5 new electric cars, plus 5 from existing Municipal fleet of 4 diesel and 1 petrol-powered cars), with 5 parking places throughout the City 	<ul style="list-style-type: none"> Proposed pilot scheme for Portugal outside Lisbon and Oporto City Municipality would supply vehicles to a 'mixed' car sharing fleet, to reduce start-up costs Additional 'clean' vehicles would be purchased to improve air quality
Donostia-San Sebastián	56	Car-Sharing Scheme in Donostia-San Sebastián	<ul style="list-style-type: none"> Introduced new car sharing scheme in Donostia-San Sebastián, using 6 vehicles (4 electric and 2 plug-in hybrids) at 3 locations 	<ul style="list-style-type: none"> First car sharing scheme outside Barcelona, and the first to use electric vehicles in Spain
Gent	2.3	Collective taxi service	<ul style="list-style-type: none"> Tried to establish new collective taxi service in the City Scheme failed as intense competition between local taxi operators lead to an inherent lack of trust and a refusal to work collectively to provide the service 	

City	No.	Title	Measure	Comments
Perugia	6.2	Innovative car sharing	<ul style="list-style-type: none"> • Study to analyse potential for car sharing • Proposed scheme for 8 vehicles initially (with 3 city cars, 3 mid-sized and 2 large cars), rising to 22 vehicles by third year of operation (10 city, 8 mid-sized and 4 large), and 30 vehicles by the end of year 5 (14 city, 11 mid-sized and 5 large) • 9 proposed sharing locations, mainly in the historic centre, with average of 3 parking spaces each 	<ul style="list-style-type: none"> • To provide mobility alternative to reduce congestion and increase inter-modal exchange with public transport • Infrastructure changes proposed - new parking spaces for different sized vehicles and engine characteristics

The *Brescia* car sharing service was introduced in March 2010 through Muovosviluppo, the company who operated the scheme, with an initial fleet of six cars and seven parking spaces in the City. Muovosviluppo and participants of the scheme used an 'Initiative Car Sharing' (ICS) system, which was integrated into the Italian network of car sharing services (see Figure 2.1). While the service was potentially available to all, Muovosviluppo decided to target its initial offering to Ikea, the University of Brescia and other public bodies, with whom it had signed agreements offering discounts to their employees to use the service, as well as to hotels and other companies.

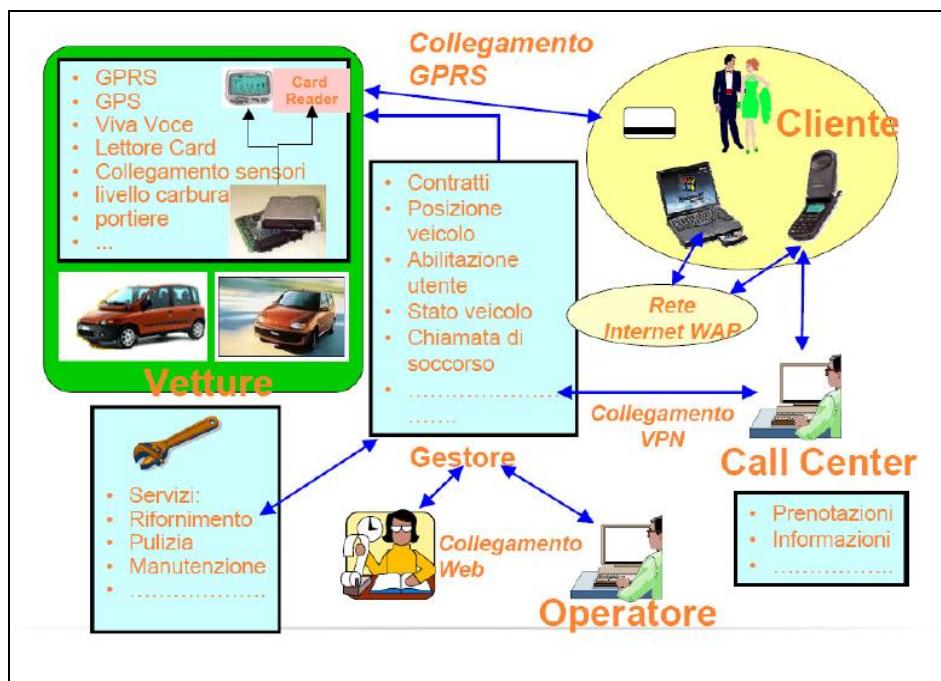


Figure 2.1 Brescia - introduced systems and technology to administer new car sharing scheme

The *Coimbra* initiative consisted of a technical and economic feasibility study for a new car sharing service, the first outside of Lisbon and Oporto in Portugal. It forms part of a complementary strategy to improve different transport modes, including the capability to integrate existing public transport e-cards with the car sharing system. The proposed scheme involves the transfer of five vehicles from the existing Municipal fleet, as well as the purchase of five new electric cars, i.e. 10 in total, which are to be housed at five locations across the City.

The *Donostia-San Sebastián* scheme started operating in October 2012, with four electric and two plug-in hybrid vehicles at three locations, after delays in the planning and design phases. It was aimed at both individuals and businesses, and is operated by Ibilek car sharing. Smartcards are used by subscribers to access the vehicles. While the cars can be used for as long as required, the vehicles have to be returned to the same location from which they were taken, and the reservation does not conclude until the car is connected to a charging point. However, onward charging at any of the IBIL public charging points in the City is free. (Both IBIL and Ibilek are owned by EVE, an energy agency from the Basque Country.) The scheme did not involve targeted promotional campaigns outside of the 'launch' events and news articles in the press, and the level of awareness for the new service was said to be low.

The *Gent* taxi sharing service was introduced by the City council to provide an alternative for those who used public transport to go out in the evenings, but wished to return home after the bus or tram service had stopped running, and did not want to pay for a normal taxi. The collective taxi sharing system was designed so that unrelated people with similar destinations could share a taxi, with the cost distributed so that the charge per person is decreased. This scheme was designed to increase the use of taxi services, but formed a small part of a wider package of measures designed to complement and improve on the quality of services offered by the local public transport operator (De Lijn).

The *Perugia* scheme wa a study to assess the feasibility of implementing a car sharing service, with the intention of integrating it into the local public transport system, particularly for connection with the Minimetrò (or Automated People Mover system). The proposed service consisted of a fleet of eight vehicles of varying sizes initially, rising to 30 vehicles by the end of Year 5, and to be based at nine locations.

In addition to these five new schemes/assessments, six measures were based on upgrades/promotions of existing services (see Table 2.2).

Table 2.2 Upgrade / promotion of existing car sharing scheme

City	No.	Title	Measure	Comments
Aalborg	53	Car Sharing in Aalborg	<ul style="list-style-type: none"> • Used new and existing media and technology to promote use and raise awareness of car sharing scheme among students and young people (see Figures 2.2b to 2.2d) • Expanded from 7 cars in 4 locations in 2008 to 9 vehicles at 7 sharing stations in 2011 	<ul style="list-style-type: none"> • New internet booking facilities, including smartphone access. • Targeted young people using social media (Facebook, email and viral campaigns), and new communication platforms (smart phones and QR codes) as well as through buses.

City	No.	Title	Measure	Comments
Bath	6.3	New mobility services for more efficient vehicle use or ownership, less car dependent lifestyles – City Car Club	<ul style="list-style-type: none"> • Introduced 6 alternative-fuelled vehicles (Figure 2.3a) at 6 new parking bays in the City (Figure 2.3b), to add to existing fleet of 6 petrol-driven cars (one further vehicle was withdrawn prior to upgrade scheme starting) • Promoted alternative vehicle use for existing car club operating in the U.K. (Figure 2.3c) 	<ul style="list-style-type: none"> • New hybrid vehicles applied to an established City Car Club • A new parking bay provides inter-modal transfer to cycle-sharing docking stations
Bologna	6.1	Car Sharing	<ul style="list-style-type: none"> • Extended existing scheme from 17 urban and 8 provincial sites (used by 30 and 10 cars respectively) to 17 additional locations • Moved from aging to more environmentally friendly fleet, with addition of 7 low-emission vehicles (including 1 hybrid and 2 natural gas-powered), to supplement 10 existing (including 2 LPG and 6 natural gas-powered) • Restyled booking website, which also provided offers and discounts to users 	<ul style="list-style-type: none"> • Provided new service options, including one-way, multiday (1-4 days) and long-time use (>4 days) • Established Facebook and Google pages to promote activities • Trialled two systems to protect bays against unauthorised parking, using sensors to trigger a parking barrier or embedded detectors to notify Control
Gent	6.2	Innovative car sharing	<ul style="list-style-type: none"> • Reinforced the growth of car sharing through new sharing stations (Figure 2.5) and encouraging companies to join • Private car sharing operator had 26 cars and 9 sharing stations prior to start of scheme 	<ul style="list-style-type: none"> • Provided incentives for residents to try the service initially for free • Introduced easier-to-use ‘pool’ card for businesses
Monza	61	Car Sharing Scheme Improvements	<ul style="list-style-type: none"> • Developed new marketing approaches to increase awareness and promote car sharing scheme (Figures 2.6a to 2.6d) as similar to car ownership, with extra benefits: <ul style="list-style-type: none"> - existing scheme had 3 cars in 3/4 locations - subscribers benefited from free-parking in paying car parks, and access to reserved lanes and barred streets • Financial benefits offered, including 50 free subscriptions lasting a year and promotional usage packages 	<ul style="list-style-type: none"> • Used surveys to identify and engage potential users, particularly young people and those living in the historic centre (i.e. no garages and difficulties with parking) • Third car in existing scheme re-deployed (from 3rd/4th location) to outside railway station to help advertise the scheme

City	No.	Title	Measure	Comments
Utrecht	6.2	Car Sharing	<ul style="list-style-type: none"> • Municipal government provided car sharing campaign to raise awareness and promote the many schemes existing in the city • Used survey to identify target user groups and both a 'top down' and bottom up' marketing approach to attempt to reach them 	<ul style="list-style-type: none"> • Bottom-up approach involved 'nudgers' who sign up through an independent organisation to form a network of 'neighbourhood mayors' to promote scheme in target areas

In 2008/9, the *Aalborg* car sharing scheme, which is administered by Hertz, comprised of seven vehicles in four locations, and smartcards were used to access the vehicles (see Figure 2.2a). The demand for the service had stagnated, and there had been an intention to target local businesses to try and increase the uptake. However, this was not seen as being feasible, following a preliminary review. This view was subsequently endorsed by the response from leafleting, and targeted mailshots with telephone follow-up to 25 companies. The project team decided to re-focus the current initiative to target young people and students, who had a low expected demand for car use, and which involved three marketing campaigns in 2011.



Figure 2.2a Aalborg - smart card used for car sharing scheme

At the same time, two more vehicles were added to the scheme, and the car sharing locations increased or moved to the University and new neighbourhoods where young people resided. These locations were decided through a GIS mapping exercise of municipal data to determine where people aged 18-24 concentrated, and the sites were increased from seven to nine. A new internet-based booking system was also implemented by Hertz, which subscribers could access through their smartphones.

The first marketing campaign (March-June 2011) used traditional media to advertise the scheme to young people throughout the City using large (1.75 x 1.2m) posters at bus shelters (Figure 2.2b), and through the electronic monitors on board buses.



Figure 2.2b Aalborg - marketing material presented in bus shelters

The monitor advertisements (Figure 2.2c) were shown at 10 second intervals every five minutes on all the City's 100 buses over a three week period, resulting in over 375,000 exposures.



Figure 2.2c Aalborg - marketing material presented on bus monitors
 (Monitors were implemented in every city bus as part of CIVITAS ARCHIMEDES measure 69)

In August-September 2011, a minor newspaper campaign was run to draw attention to the relocation and addition of new car sharing locations.

The third campaign (December 2011) was targeted at those with advanced technology skills, which required them to solve a programming puzzle, i.e. break a 'cookie', set up a Really Simple Syndication (rss) feed, and find another site to provide their contact details in order to enter a prize draw. Prizes included an iPhone, as well as free annual memberships of the

car sharing scheme. This campaign also deployed a wide range of new media to advertise the access to the competition, including Facebook links, 'viral' emails, an on-line magazine, and flyers distributed in buses that used Quick Response (QR) codes (Figure 2.2d) which could be interpreted by smartphones with a QR reader.



Figure 2.2d Aalborg - front and back of a flyer, showing use of Quick Response (QR) codes

The *Bath* scheme involved an expansion of the existing service, which is run by the City Car Club (CCC) for both corporate and individual subscribers. The CCC operates over 550 vehicles in 14 other cities in the U.K. The service was expanded to 12 vehicles in April 2010, with the addition of six new leased Toyota hybrid cars (Figure 2.3a) at six new sites, in what is a hilly and physically-constrained historic City. This includes a parking bay at Sydney Place (Figure 2.3b), which provides inter-modal transfer to one of the four cycle-sharing docking stations in the City.



Figure 2.3a Bath - new hybrid vehicle (Toyota Prius) deployed for City Car Club



Figure 2.3b Bath - location of six new Car Club bays, set in physically constrained / hilly City

The scheme expansion was accompanied by local leafleting and advertisements in the press (Figure 2.3c), as well as through CCC social media promotions on Facebook and Twitter.



Figure 2.3c Bath Chronicle Newspaper Advert - October 2010

Bologna has a well-established car-sharing service, and this scheme sought to expand it from 17 urban and 8 provincial sites to a further 17 locations (see Figure 2.4 for example). The service is linked to the national Iniziativa Car Sharing (ICS) scheme and is managed by Azienda Trasporti Collettivi (ATC). ATC also manages on-street parking, and the issuance of car access permissions to the central area of Bologna, and is part of the public transport operator Trasporto Passeggeri Emilia-Romagna (TPER). The upgrade scheme included integration of the system with the Mi Muovo card used for public transport.



Figure 2.4 Bologna - new sharing location, with unauthorised parking enforcement signs

The scheme included one hybrid, two natural gas and four Fiat 500 (Euro 6 standard) vehicles, to supplement the pre-existing 10 low-emission and 40 older vehicles - a fleet total of 55 in 2012. The scheme also implemented and tested two mechanisms to protect against unauthorised parking. This can be a major problem for the operation of car sharing services in city centres, as it prevents users from leaving the vehicles in authorised spaces. In the first system, an entry post was lowered when a radio frequency sensor recognised a scheme vehicle. As this was sometimes triggered by a passing scheme vehicle, it was replaced by a manual booking code system. The second system uses sensors embedded beneath the parking spaces, which communicate with the parking meters (or 'concentrators') using the Zigbee wireless protocol. These in turn send information about the status of the spaces directly to the control centre via General Packet Radio Service (GPRS) mobile telecommunications. If necessary, an enforcement procedure for the timely removal of any unauthorised vehicle can be activated. While the first system was reported as being 'more efficient', in both cases the car sharing vehicles are equipped with a tag, which can be detected by the sensors.

The Gent (Cambio) upgrade scheme formed part of a package of measures designed to change mobility behaviour, and reinforce the growth of car sharing, especially in the targeted European Logistics Advisory Network (ELAN) corridor. This involved a number of measures, including:

- introducing more sharing stations, with new information panels (Figure 2.5);
- using more effective 'word-of-mouth'-based communications tools to engage the community and promote the service, including 'client ambassadors' and 'home parties', as well as through Facebook;
- providing a free trial for local residents;
- actively targeting 250 companies through mailshots (with 150 follow-ups by telephone), and the introduction of a 'pool' card to access vehicles. The service had previously been aimed at private users who tended to use the shared cars mainly in the evenings and at weekends.



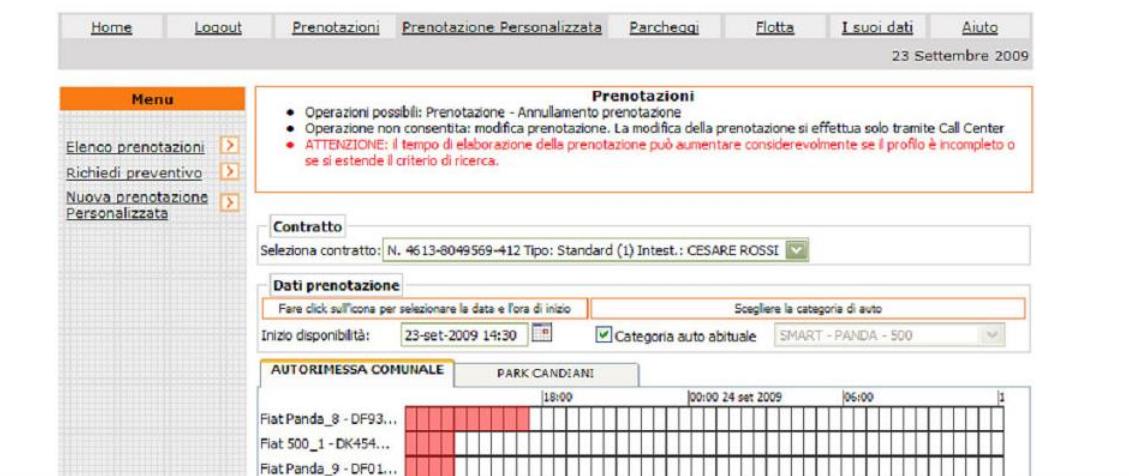
Figure 2.5 Gent - sharing station information panel, front (left) and back (right)

Monza had a small established car sharing service, which was transferred to GuidaMI, a special company created by Azienda Trasporti Milanesi (ATM), the local public transport operator, for this purpose in 2009. Subscribers log onto the GuidaMI website (Figure 2.6a) to book the service, and use a smart card to pick up or release (Figures 2.6b and 2.6d respectively) the compact-sized vehicles (Figure 2.6c).

The scheme principally involved an information campaign using websites, posters and flyers to promote car sharing as being similar to car ownership. Extra benefits included access to free parking in areas with a parking fee, the use of bus and other reserved lanes, and the ability to circulate in streets that are usually banned for traffic, or when bans are enforced on days when pollution levels are high. The information campaign was supported by a Municipality-subsidised promotion, offering 50 free annual subscriptions, of which 25 were targeted at 'young people' aged between 18 and 35, to encourage them to try out the service. The campaign was originally intended to run until December 2011, but was subsequently extended to December 2012. In addition to the campaign, one of the shared vehicles, which had previously been deemed ineffective, was relocated to the main rail and bus station to help appeal to new users.



Al fine di semplificare il processo di prenotazione, la visualizzazione della disponibilità delle risorse è mostrata automaticamente, quando "prenotazione" (vedi figura).



The screenshot shows the 'Prenotazioni' (Bookings) section of the iGuido website. On the left, there's a 'Menu' with options like 'Elenco prenotazioni', 'Richiedi preventivo', 'Nuova_prenotazione', and 'Personalizzata'. The main area displays a 'Contratto' (Contract) selection, a 'Dati prenotazione' (Booking data) section with a date input (23-set-2009 14:30), and a 'CATEGORIA AUTO' (Car category) dropdown set to 'SMART - PANDA - 500'. Below these is a grid titled 'AUTORIMESSA COMUNALE' (Communal Garage) showing vehicle availability. The grid lists three cars: Fiat Panda_8, Fiat 500_1, and Fiat Panda_9. The grid shows red squares for unavailable slots and white squares for available slots. The Fiat Panda_8 row has a red square at 18:00, indicating it is booked.

Figure 2.6a Monza - car sharing online booking form



Figure 2.6b Monza - car pick up process



Figure 2.6c Monza - typical car sharing vehicle



Figure 2.6d Monza - car release process

The *Utrecht* scheme was similar to that in Monza. Initially, research using on-line surveys was conducted to select the neighbourhoods that had a high potential for car sharing growth. Subsequently, both bottom-up and top-down communications approaches were adopted, and the scope widened to include the surrounding neighbourhoods and the rest of the province. A networking organisation, Nudge, along with a marketing agency, Emotion, developed and implemented the campaigns. The top down approach covered the entire municipality, and included promotional flyers, launch events, as well as an informative website, which described the different car sharing services in Utrecht, where people could sign-up directly. In parallel, Nudge targeted specific neighbourhoods from the bottom up, with the appointment of 'nudgers' to promote services in particular areas.

Also, the project team targeted colleagues from the municipality, to convince them of the benefits of using the services, and encouraged them to include car sharing into future policies and other campaigns, e.g. for inter-modal choice with cycling.

2.2 CAR POOLING

The two new car pooling measures in this cluster are summarised in Table 2.3.

Table 2.3 Implementation of car pooling measures

City	No.	Title	Description of measure	Innovative aspects
Craiova	M06.04	Flexible services for industrial areas in Craiova	<ul style="list-style-type: none"> • Introduced new car pooling scheme for employees of public transport provider, RAT • Website application to help match potential participants by their address and walking distance - generated 33 groups of 3-5 people • Municipality provided free parking area near to company headquarters, with free space for each pooled car (at least 3 participants) • Access to parking lot restricted - cars must be registered beforehand • Scheme run as pilot over 2 months 	<ul style="list-style-type: none"> • Promoted new mode of transport in industrial area not served well by public transport • Targeted specific user group of RAT employees • Claim as first car pooling service in Romania
Perugia	6.1	Encouraging high occupancy vehicles - car pooling	<ul style="list-style-type: none"> • Web portal ('Fi-Start') to manage new car pooling scheme, including details of participants, and matching those seeking a ride with those offering one • Parking site piloted in Engineering Faculty, in partnership with the University of Perugia • Automatic barrier provides access to 50 spaces for pooled cars (with at least 3 registered car-poolers per vehicle) 	<ul style="list-style-type: none"> • New design of automatic barrier, triggered by loop detectors in the road, which is able to verify the simultaneous presence of a minimum of 3 people inside a vehicle (Figure 2.7), by reading their car pool smartcards as presented near the windows (through glass if necessary), and using facial recognition software to confirm the number of individuals

The Craiova scheme introduced a car pooling measure for the employees of RAT, the local public transport operator. Software and a website were developed to record the details of potential participants from the company, and used to match people through their addresses and walking distance to each other by email. This generated 33 pools or groups of 3 to 5 people, i.e. 122 participating RAT employees.

The Municipality then provided parking near the company headquarters, which was served only by trams every hour, with a free space for each pool that had attracted at least three participants. Access to this parking area was restricted - and the number plates of the pooled cars had to be registered and recorded in the database beforehand. Initially, a number plate

recognition system was envisaged to operate an automated barrier, which prevented access. However, it was not until October 2012 that the scheme began operating, with access to the pooled spaces protected manually. The scheme essentially ran as a pilot for less than two months, for the purpose of the impact evaluation.

The *Perugia* scheme was established in partnership with the University, and piloted in their Faculty of Engineering, Santa Lucia. It involved setting up a Web portal, called For Innovation - Start (Fi-Start), which was used to match the demand and supply of trips for users registered in the system, i.e. matching those seeking a ride with those offering one. An area within the Faculty car park was marked out, and a barrier imposed to provide access to 50 spaces for the pooled cars, which needed to contain at least three registered occupants. The scheme required a new barrier design, which would be triggered by loop detectors in the road, and linked to cameras that were able to verify the presence of at least three people inside the vehicle (see Figure 2.7 for the prototype version tested).



Figure 2.7 Perugia - prototype detectors as used in automatic barrier for pool car park

The system required three occupants to present registered smartcards near to the vehicle's windows, which would be detected by antennas placed near the barrier. The system also used the cameras to capture images of the four windows at the side of the vehicle simultaneously, and facial recognition software used to verify the presence of at least three people in the car.

3. DRIVERS AND BARRIERS

3.1 INTRODUCTION

3.1.1 Background and methodology¹

The main goal of the process evaluation procedure of CIVITAS-POINTER is to develop new findings about factors of success, and strategies to overcome possible barriers during the implementation phase of CIVITAS Plus measures by cross-site analyses of all relevant information. A specific focus lies in the identification of potential barriers, but information on factors of success, such as drivers, is needed as well. Barriers and drivers may differ during the various stages of the measure. Therefore distinction has been made in three different phases:

1. Preparation phase: the measure is developed in detail and design work for the measure is conducted. At the end of this phase all planning details are fixed, including all decisions and permissions that are a pre-condition for starting the implementation phase.
2. Implementation phase: the measure is implemented in real life. At the end of this phase the measure begins operation.
3. Operation phase: the measure is opened to the public, i.e. users are able to increase their utility. The first phase of operation lies within the time-frame of the CIVITAS Plus Initiative and can be analysed and evaluated by CIVITAS POINTER. The long-term running is the outstanding time (beyond the CIVITAS II Initiative) until the measure comes to the end of its life. This could be caused by technical issues, programme termination, end of funding, redesign, or reconstruction.

The process evaluation framework is built upon three information blocks, each of which has his own form. The first block is called measure evaluation and results in the completion of the so called Measure Process Evaluation Form. It should be completed for all measures, not being a focussed measure. The second building block consists of the subset of focused measures. These measures are selected based upon several criteria. One of the criteria was the possibility to conduct a proper Cost Benefit Analysis (CBA). The aim of the focussed measures is to get a deeper insight of the selected measures. The forms which provide information for the two blocks above are completed several times during the programme and functioned as a basis for the completion of the last building block: the process evaluation part of the Measure Evaluation Report Template (MERT).

The raw information of the various forms showed that the drivers and barriers are extremely measure and site specific, however, for analysing and reporting purposes they have been grouped into so called barrier and driver fields. An overview of these fields can be found in Annex 1. Specific and detailed information about the barriers and drivers of the measures is to be found in the individual MERT.

3.1.2 Aim and structure of this chapter

The starting point of the process evaluation at cluster level is that policy makers and other stakeholders are interested in understanding the barriers and drivers that may be relevant for

¹ A detailed description of the objectives and methodology of the process evaluation is to be found in other POINTER reports...

the measures. The process evaluation data of the MERTs were put in a database and analysed on a aggregated level with SPSS for the various sub clusters. (Specific information should be obtained from the individual MERTs.)

The data for 13 measures are available for this cluster on Alternative Car Use, divided into two sub-clusters.

Table 3.1: Sub clusters and number of measures

Sub cluster	Number of measures
Car sharing	11
Car pooling	2
Total	13

An overall description of the cluster is given in Section 3.2 (for background information: see annex 2). Barriers and drivers are described in Section 3.3. The outcome as distilled from the measure information is given in Section 3.4.

3.2 CLUSTER OVERVIEW: GENERAL ASPECTS

To put the findings of this cluster in a sound perspective, it is important to have insight in the quality of the process evaluation data gathered. Therefore, distinction has been made in three quality levels: (i) low quality means that data are not / hardly useful due to the use of non-current MERT forms and / or a lack of understandable answers on the questions; (ii) medium quality means that the data are useful, although not all the crucial questions (barriers, drivers, actions and recommendations) are well completed; (iii) high quality means that the data are very useful because all questions are answered well or at a fairly acceptable level, although variability in the quality of the answers may exist. Some 15% of the process evaluation data are of low quality, 38% of medium and 46% of high quality. The Alternative Car Use cluster has a larger proportion of measures with low quality process evaluation data as well as a greater proportion of high quality measures than all the CIVITAS Plus measures together (15% and 36% respectively). The focussed and non-focussed measures are 15% and 85% respectively in the cluster, against 30% and 70% for all measures indicates that the focussed measures are somewhat underrepresented. However, it must be realized that the number of measures in the cluster is rather small so the influence of one or two measures is relatively large.

The results of the Alternative Car Use measures differ from the overall results in the extent of innovative aspects. In more than 62% of the measures, the innovative aspects are related to specific target groups, which is far more than for all measures (39%). Innovative concepts and technology aspects were mentioned in 62% and 46% of this cluster's measures respectively. Over all CIVITAS Plus measures, the equivalent figures are 48% and 45%. In almost one third (38%) of the Alternative Car Use measures innovation is found in new transport modes. Considering the aim of this cluster, it is unsurprisingly that this percentage was far more than for all measures (13%).

The findings are in line with the tactical and operational goals of the cluster. At the tactical level, the most frequently mentioned goal was 'alternative private car use' (54%) and



operational goals were to a large extent focused on the implementation of car sharing / carpooling, the increase of the use of public transport and a reduction in private car use. The strategic aims of the cluster were related to the longer term goals of reducing the environmental impact of mobility (54%) and increasing modal shift from cars (38%).

3.3 BARRIERS AND DRIVERS

3.3.1 Introduction

The aim of this cluster was to encourage the alternative use of cars by car sharing and carpooling. The cluster contains 13 measures, 11 of which deal with car sharing and 2 with carpooling. The barriers and drivers for all 13 measures are considered below, with possible differences between the types of measures discussed.

3.3.2 Barriers

The measures faced many barriers (see annex 3). A more detailed overview of the barriers per measure is given in Table 3.2.

Political barriers play a modest role at the preparation stage (8%), and no role at the implementation and operation phase. However, in the case of Donostia-San Sebastian, the political barrier resulted in an only moderately successful implementation of the measure, as the local elections resulted in a delay in launching a tender. Other major barriers at the preparation stage encountered in this measure (Car-sharing scheme for electric vehicles) were the need for infrastructure for recharging points and the institutional discussion as to whether a tender was legally required. At the implementation stage of the measure, that citizens were unaware of the possibility of sharing cars, appeared to be a major barrier in Donostia-San Sebastian. A focus on individual car ownership by the local population was substantial. The most mentioned barrier at the preparation stage related to organizational aspects (38%), and this played a substantial role at the implementation phase, but only a minor role in the operation phase. At the implementation stage, cultural (31%), financial, organisational, institutional and spatial (all 23%) barriers arose. Cultural barriers were found in Bologna where the car is a status symbol, Monza where owning a car is the habit and Coimbra. In the latter city, the cultural barrier was related to a lack of experience of car sharing, although the underlying reason was probably the same cultural barriers as for Monza and Bologna. The Gent measure on establishing a taxi sharing service to replace public transport and car use at night faced almost all the major barriers mentioned. This prevented the implementation of the measure. There was no support by the taxi operators, who refused to cooperate (organizational barrier) and to fund a collective taxi system (financial barrier). Furthermore, the city of Gent lacked the legal means to force the taxi operators to work together (institutional barrier). Examples of spatial barriers were found in Bath and Monza. In Bath this resulted from the complex nature of UK planning laws that require extensive planning and public consultation in order to designate part of the public highway as a car club permit holder parking space. Monza showed a spatial barrier of a very different nature, i.e. the illegally occupation of parking places reserved for car sharing vehicles. A relatively small number of barriers were mentioned at the operational stage.

It is remarkable that both the car pooling measures faced more problems in the implementation phase than the other measures. In the case of Craiova, the municipality could not prove that it was the owner of the land for the parking space (institutional) which caused a delay in the tendering procedure. Also, initially no one was willing to tender. In the case of Perugia, an institutional barrier was that the pilot site was not managed by the municipality. This resulted in discussions on the exact utilities to be applied and about the responsibility for the necessary investments (organizational-financial barrier). Despite these barriers, both measures were implemented successfully.

Table 3.2: Measures and barriers per measure stage

Measure Car Sharing	Measure Title	Success ²	Preparation	Implementation	Operation
Aalborg 53	Car sharing in Aalborg	2	Organizational	Problem related, Financial, Spatial, Planning	Financial, Problem related, Spatial, Planning
Bath 6.3	New mobility services for more efficient vehicle use or ownership, less car dependent lifestyles – City Car Club	3	Technological	Spatial	Technological, Financial
Bologna 6,1	Car Sharing	2	Spatial	Cultural, Financial	Institutional, Cultural
Brescia M06.05	Car Sharing in Brescia	2	Planning		Organizational
Coimbra M06.03	Feasibility of New Mobility Services in Coimbra	N/A	Organizational	Cultural, Financial	
Donostia - San Sebastian 56	Car-Sharing Scheme in Donostia-San Sebastián	1	Political, Technological, Institutional	Cultural	
Gent 6.2	Innovative car sharing	3	Organizational		
Gent 2.3	Collective taxi service	0	Organizational, Institutional, Involvement, Financial		
Monza 61	Car Sharing Scheme Improvements	1	Involvement, Technological	Cultural, Spatial	Financial, Spatial
Perugia 6.2	Car Sharing	N/A	Financial, Involvement, Planning		
Utrecht 6.2	Car Sharing	1	Financial, Organizational	Institutional	
Measure Carpooling					
Craiova M06.04	Flexible services for industrial areas in Craiova	2		Institutional, Organizational,	Positional
Perugia 6.1	Encouraging high occupancy vehicles - car pooling	2	Other, Cultural, Technological	Organizational, Technological, Institutional	Institutional

² Rating of success of implementation: 0=not successful, 1=moderately successful, 2=successful, 3=very successful. This rating is used in all of the upcoming tables regarding barriers and drivers

3.3.3 Drivers

At the preparation stage, political drivers were by far the most frequently mentioned (i.e. in 46% of the measures). An example of the important role of political drivers was found in the measure ‘Encouraging high occupancy vehicles - car pooling’ in Perugia. Here the planning of the measure was very closely linked to the Urban Mobility and the Municipality Energy Action Plans that explicitly referred to increasing car occupancy in Perugia. Following local elections in June 2009, the issue of sustainable urban mobility remained a priority in the urban policy agenda. In the successfully implemented measure ‘New mobility services for more efficient vehicle use or ownership, less car dependent lifestyles – City Car Club Club (CCC)’ in Bath, a political driver was mentioned together with the financial driver of CIVITAS Plus funding. Without this funding, CCC’s technological development would have been much slower and the company would not have been in a position to double the fleet size. In Bath, the political support also resulted in the speeding up of finding locations for on-street parking. Normally this is a very complex and long term process. At the other two stages, political drivers did not play a role. Other frequently mentioned drivers at the preparation phase were the financial, organizational and the involvement drivers. All three are mentioned for 23% of the measures. The financial driver, as well as organizational and technical drivers, was mentioned in 23% of the measures at the implementation stage. In Craiova, the technological driver was related to a software application as a tool to support carpoolers. The involvement of stakeholders was the most cited driver at the operation stage (31%). In Perugia, involvement as an agreement between the municipality and the company that runs the city car-park service led to municipality employees having the chance to buy discounted season tickets which enabled them to park close to their offices when cars contained at least three people.

Table 3.3: Measures and drivers barriers per measure stage

Measure Car Sharing	Measure Title	Success	Preparation driver	Implementation driver	Operation driver
Aalborg 53	Car sharing in Aalborg	2	Financial, Problem related	Problem related	Problem related
Bath 6.3	New mobility services for more efficient vehicle use or ownership, less car dependent lifestyles – City Car Club	3	Political, Financial	Technological, Spatial	
Bologna 6,1	Car Sharing	2	Political, Planning	Financial	Institutional
Brescia M06.05	Car Sharing in Brescia	2	Political	Spatial	Involvement
Coimbra M06.03	Feasibility of New Mobility Services in Coimbra	N/A	Organizational, Involvement	Planning	
Donostia - San Sebastian 56	Car-Sharing Scheme in Donostia-San Sebastián	1	Political, Positional, Cultural	Positional, Financial	
Gent 6,2	Innovative car sharing	3	Organizational, Involvement	Involvement	Involvement, Cultural
Gent 2,3	Collective taxi service	0	Financial, Technological		

Monza 61	Car Sharing Scheme Improvements	1	Political, Cultural	Financial, Organizational	Involvement, Financial
Perugia 6.2	Car Sharing	N/A	Positional, Planning, Organisational		
Utrecht 6.2	Car Sharing	1	Problem related	Problem related, Organizational	
Measure Carpooling					
Craiova M06.04	Flexible services for industrial areas in Craiova	2		Institutional, Organisational	Positional
Perugia 6.1	Encouraging high occupancy vehicles - car pooling	2	Other, Cultural, Technological	Institutional, Technological, Organizational	Institutional

3.4 OUTCOMES

- Political support is an important driver, especially at the preparation phase and was mentioned for 46% of the measures. The reason for this is that this cluster requires a paradigm shift from car ownership to car use. Politicians and local governments have an important role in this shift by stimulating (speeding up) institutional changes (for example in Bath), declare city planning and mobility visions (for example in Perugia), etc. However, the lack of political support may cause a chain reaction to other barriers, which are difficult to overcome.
- The paradigm shift is often hampered by cultural barriers such as when owning a car remains attractive or habitual. These were explicitly mentioned in Bologna and Monza, but probably are main barriers everywhere.
- Institutional aspects can be either a barrier or driver. An example of the first is found in Gent, where a barrier was the lack of legal means to force the taxi operators to cooperate in establishing a taxi sharing service. An example of institutional aspects as a driver was found in Bath where the process of getting permission of on-street parking for the City Car Club was able to be speeded up.
- Spatial barriers were often related to finding suitable locations for carpooling or for locations with special services such as recharging points for electric vehicles (for example in Donostia-San Sebastian).
- Spatial barriers sometimes are caused by the danger of split incentives, i.e. who has to invest and who gets the revenues? This discussion was seen in Perugia, where the pilot site was not managed by the municipality.
- Involvement in terms of special arrangements between stakeholders or target groups can function as a barrier, but also as a driver. This was seen in Perugia, where an agreement between the municipality and the company that runs the city car-park service led to additional carpooling service.

- Technological barriers occurred mainly at the preparation stage. For example, in Bath, there was a lack of sufficient number of electric and or hybrid vehicles due to market circumstances at that time. The availability of suitable and well-functioning software plays an important role. In Monza the booking software for the car sharing scheme did not function optimally which caused a barrier, but in Craiova the software supported the car-poolers well and acted as a driver.

4. IMPACTS

4.1 CAR SHARING

11 of the 13 measures in this Cluster relate to car sharing. A summary of the outputs and impacts for these is given in Table 4.1.

Table 4.1 Achieved Outputs and Impacts for car sharing

City	No.	Outputs	Economy Energy Environment	Transport	Society	Comments
i) Implementation / assessment of new car sharing scheme						
Brescia	M06.05	<ul style="list-style-type: none"> ● Introduced car sharing service for the City ● Integrated this service into the Italian network for car sharing (ICS) 	<ul style="list-style-type: none"> ● Business case predicated on assumption of increased km use in car sharing of 28.8% per annum over 15 years (from a base of 16,022 km in 2010); no comparison conducted for energy and environmental benefits 	<ul style="list-style-type: none"> ● 292 members as at May 2012 ● 6 vehicles (3 petrol and 3 natural gas powered) in 7 locations, which provide modal interchanges to bus and cycle sharing stations 	<ul style="list-style-type: none"> ● 18% increase in awareness of car sharing scheme (from 11 to 29%) between March 2010 and April 2012 ● acceptance level increased by 7% through the same period (from 9 to 16%) 	<ul style="list-style-type: none"> ● Some inconsistencies in the survey data reported between different dates for awareness and acceptance levels ● Other static data, e.g. on emissions by vehicle and the scheme operating costs are good
Coimbra	M06.03	<ul style="list-style-type: none"> ● Proposal to introduce car sharing scheme for 10 vehicles in the Municipality ● Intention to integrate scheme with other services provided by local public transport operator ● Projected benefits based on existing use of Municipal fleet by personnel (which could be over optimistic - see right for scenario used) 	<ul style="list-style-type: none"> Scheme to provide: <ul style="list-style-type: none"> ● net operating revenues of 0.04 euros per vehicle km operated, against initial capital costs of 175,000 euros (for 5 new electric vehicles, on-board equipment and other costs), i.e. payback is more than 32 years ● expected fuel efficiency energy savings of -0.84 MJ per veh km ● improvements to CO, CO₂, NO_x and other emissions 	<ul style="list-style-type: none"> ● No survey of potential users was carried out - said to be expensive ● Assessment is based on scenario of 25 users per vehicle, with an average of 3 reservations per month, and each vehicle trip lasting 15km, i.e. total of 13,500 km per vehicle per annum 	<ul style="list-style-type: none"> ● Intention is to promote awareness of the scheme and disseminate findings to other stakeholders and cities in Portugal 	<ul style="list-style-type: none"> ● Data provided for the main indicators are good ● Assumptions used for assessment may be unrealistic, based on experience of initial take-up from other schemes

Of the 11 car sharing measures, five involved the introduction or assessment of a new scheme (*Brescia, Coimbra, Donostia-San Sebastián, Gent taxi sharing and Perugia*), and six (*Aalborg, Bath, Bologna, Gent car share, Monza and Utrecht*) involved the expansion or promotion of an existing service.

The core objective of establishing/assessing and expanding/promoting a car sharing service was fully or partly achieved in every scheme, apart from those in *Donostia-San Sebastián* and *Gent* (for taxi sharing). These measures also added value in raising the awareness and importance of sustainable transport more generally.

In *Donostia-San Sebastián*, the three subscribers to the service, after two months of operation, fell well short of the original target of 300-500. This was attributed to a lack of a targeted or sustained promotional campaign and a low level of awareness prior to implementation, i.e. only 14% of those surveyed in March 2012 were aware of its impending launch. Of those who knew about the service, 63% rated it as either good or very good, and the municipality was said to be in the process of developing an extensive promotional campaign. However, it should be noted that no survey sizes were given, other than that a 'representative sample' of people from different age groups, gender and occupations was taken from the three neighbourhoods affected by the scheme.

The measure to introduce a new *Gent* taxi sharing service was stopped in Autumn 2009, as it became apparent there was fierce competition and mistrust among the local taxi operators, and they refused to cooperate to develop the scheme. This highlighted the importance of engaging all stakeholders at the outset.

All other city measures were found to be more successful. In the case of the new service in *Brescia*, awareness was said to have increased from 11 to 29% between March 2010 and April 2012, i.e. from before the start of the scheme, to when the scheme had been running for 24 months. Acceptance level rose from 9 to 16% over the same period.

Some discrepancies and inconsistencies are evident in the information reported. The results were based on a telephone questionnaire of families conducted across the Municipality and examples of inconsistencies in the awareness survey are:

- the before (or 'ex-ante') situation was stated as being January 2010 in the main report, but March 2010 is given in the Annex;
- while a total of 600 family replies was identified as being needed in order to provide 90% statistical significance in the results (and 787 families had been contacted ex-ante), only 220 were said to have answered the phone calls;
- however they were 601 completed questionnaires (because families were said to be composed of more than one member), but the results showed a total sample size of 693 for March 2010, and a much lower one of 97 for April 2012;
- this in turn contrasts with a total sample size of 657 for the acceptance level survey in April 2012.

At the same time, the quality of service for users of the scheme and the average vehicle occupancy were said to have fallen between June 2011 and April 2012, although again there appears to be inconsistencies in reporting. For example, the survey in June 2011, i.e. after the scheme had started, was said to be taken from newsletters sent to subscribers, in addition to users of the car sharing website, which produced 10 replies from the 30 car sharing users, or 18% of the total number of subscribers at the time. For the April 2012 survey, data was taken from the website only, and this resulted in 18 of the 287 car sharing users replying. Thus the changes identified have limited value.

Also, the main quantifiable targets for assessment were given as the number of subscribers, along with the number of vehicles and parking spaces operating in the scheme. While these targets were mostly achieved or exceeded, the scheme failed to meet its target to expand to 10 cars, with the fleet remaining at 6 at the end of the scheme. There was no realistic attempt to quantify energy or environmental benefits. For economic impact, the business case is predicated on monetised fuel and emissions savings, but assumes a compound increase in the km used of almost 29% per annum over 15 years, from some 16,000 km in 2010 to over 1,500,000 km in 2025. This is unsubstantiated, and may not be realistic. For the energy/environmental impacts, the fleet was said to be small, and therefore not seen as significant in reducing the emissions in the City.

Similarly, the *Coimbra* scheme was said to be a ‘success’, as a feasibility study only, and no survey of the potential numbers of users was carried out. The proposed scheme was expected to generate net revenues of 0.04 euros per vehicle km operated, with further fuel energy savings of -0.84 MJ per vehicle km, as well as improvements to CO, CO₂ and NO_x emissions, principally through the introduction of the five new electric cars. However, these impacts are based on a projected scenario of 25 users per vehicle, with an average of three reservations per month, with each vehicle trip lasting 15 km. These assumptions may be unrealistic, but result in a projected payback period of 32 years. However, the intended start-up costs are said to be reduced because of the free transfer of five further vehicles from the Municipal fleet, although the availability of these cars to other subscribers would then be reduced to after working hours on weekdays and at weekends as a consequence.

The report from the *Perugia* project, which is another car sharing assessment, is incomplete.

The *Aalborg* measure is one of expansion and promotion. However, despite the innovative marketing campaigns, as well as increases in the number of cars and locations, use of the service decreased from 1,064 rentals and some 89,800 vehicle km in 2008/9 to 833 rentals and about 65,200 veh km in 2011/2. This was accompanied by a price rise by Hertz in December 2010. Awareness of the service also appeared to decrease between 2006 and 2012, although the former was based on responses from students at the University, whereas the latter came from employees. The project team concluded that, despite the relatively intense marketing campaigns, the City fundamentally lacked other drivers or financial incentives which would encourage people to use the service, but no evidence was given to support this.

Bath, another expansion scheme, showed an increase in subscribers from 97 in 2007 to 418 at the end March 2012. Awareness of the service also increased more widely, from 28.1% in 2010 to 39.8% in 2011 among local City residents who were not already members of the Bath City Car Club. However, this followed an existing upward trend in usage, with membership rising from 89 at the start of 2007 to 127 in 2008. The project also attempted to quantify the social benefits in switching to hybrid vehicles, which formed part of the upgrade.

The (mainly societal) impact indicators were derived through three different data sources, and analysed with a sound statistical approach:

- an online survey of new and existing members at the end of September 2011;
- a subsequent in-depth face-to-face or telephone interview with 16 members who had responded to the survey; and
- an on-street survey of Bath residents (i.e. non-members of CCC) conducted in 2010 and 2011.

The social benefit or change in Net Present Value (NPV) through the replacement of a petrol-driven car (Vauxhall Astra) with the hybrid car (Toyota Prius) was calculated to be £179.41 per vehicle over five years (at 2010 prices), or £1,077 across a 6-car fleet. The Toyota Prius was 36% less expensive in terms of fuel costs than the Vauxhall Astra, but incurred a higher capital leasing cost. These costs were offset against the benefits associated with the reduced emissions and pollutants from the hybrid car, taken from the manufacturers' official figures, and the 2011 estimating guidelines provided by the U.K. Department of Energy and Climate Change (for CO₂ emissions), and the 2010 estimates for damage costs (for NO_x and particulate matter), produced by the U.K. Department for the Environment and Rural Affairs. The NPV was calculated over the period 2010-2014, as five years were said to be the average period when CCC would replace its leased cars, and is based on a discount rate of 3.5% per annum. (There was little sensitivity to a change in the discount rate.) Overall, the various measurement methodologies employed in this scheme seemed to involve a fair degree of rigour. The project also introduced research from Carplus (a U.K. charity), which showed that each new shared car removes over 24 privately-owned vehicles from the road, and that members of car sharing schemes engaged in 35% fewer car journeys than non-members overall.

In the case of *Bologna*, the service expansion was said to have been planned in 2008, but did not occur until September 2010, due to a financing problem. Overall, car club membership was said to have increased from 1,062 in 2008 to 1,118 in 2012. However, use of the car sharing service had decreased in 2011 compared to 2010, i.e. after the fleet had expanded. This was attributed to the economic downturn that forced people to reduce consumption. (Operating revenues were reported to have increased, but these were due to higher charges being imposed for rental.)

This scheme also reported a 'success', based on the final number of shared vehicles available per capita, as compared to Milan and Rome. The implementation was also said to have been 'achieved in full', from the perspective of the targets and objectives that were set. However, these targets were loosely defined, i.e. to 'decrease the motorization rate in sensitive areas', 'reduce the occupation of public space by private cars, while supporting public transport' and 'prevent the occasional driver from buying a new car; offer sustainable alternative to public transport', and there was little evidence to clarify or substantiate what the objectives might entail, although it was said that the new car sharing locations would be 'close to bus stops of the main public transport lines' and some locations would be 'equipped' with cycle racks for the free cycle-sharing service.

There were seemingly inconsistencies in the reported data. For example, it was difficult to discern from the impact analysis exactly how many cars were made available at what points, and their associated fuel-types, other than that the final number of vehicles was 55 in 2012. The deployment of additional environmentally-friendly vehicles made comparisons with the notional baseline of 2008 difficult, particularly in terms of the benefits to be derived from energy savings and reduced CO₂ emissions. Nevertheless, the energy consumption for running the more ecological fleet was said to have been reduced by 6.3% between 2008 and 2011, from 0.0548 tons equivalent petrol (TEP) per 1,000km to 0.0514 TEP/1000km. However, the 2011 value represents a slight increase over 2010 (from 0.0509 to 0.0514 TEP/1000km), which is presumably due to the fleet having been enlarged, and this similar trend is reflected in the CO₂ emissions. In addition, while the two parking controlled systems tested in Bologna were relatively innovative, there were no metrics set for reporting their performance.

For the *Gent* car sharing expansion scheme, the number of private users grew from 674 in 2008 to 1536 in 2012, and the number of sharing stations was increased from 18 to 22. This reflects a strong underlying subscriber growth rate between 2009-2012 (average growth of 216 users per annum), as compared to 2005-2008 (169 users per annum). Comparisons of subscriber numbers were made between the periods before and after the three free trials in 2009, 2010 and 2011. This showed a higher growth trend than would otherwise have been expected, and suggest the free trials did encourage subscriber take up, although the longer term impacts (without any further free trials), and the effects of this subscriber growth on actual usage in terms of, for example vehicle km's used and the revenue generated for the operator, are unknown. In addition, 27 companies joined the pool card system (representing 11% of those contacted), with 170 pool cards. This is over five times greater than the target of five companies, which was also considered a success. No information has been given on the impacts on indicators, and the cost/benefit analysis was said to be not applicable.

For *Monza*, the vehicles in the car sharing scheme were said to cost GuidaMI approximately 5,000 euros a year to run, including leasing costs and maintenance. However, when other charges are factored in, such as staff costs, petrol, and software and hardware maintenance, the operating costs were said to have increased to 10,000 euros per annum. This cost is broadly equivalent to the subsidy contributed by the Municipality as part of subsidising the scheme, and the business case is predicated on this, as the service had insufficient use to break even. It was stated that GuidaMI would not be able to operate in Monza, but for the sharing of revenues with Milan, as there is joint management of the service between the two cities. As a result of this promotion scheme, the number of active users were said to have increased from 40 in 2007 to 146 in 2011, although the number of rentals grew by only 168 to 582, which suggests the 50 free subscribers may not have been particularly active. No assessments of the energy or environmental impacts were given, and the societal survey results provided relatively low numbers for the data to be meaningful.

The start of the *Utrecht* scheme was delayed until 2010, because of budgetary problems. The campaign only commenced in June 2012, and the impact evaluation was based on partial data only. The number of car sharing members was said to have increased by 298 between June and August 2012, or from 2,877 to 3,135 members, i.e. by just over 10%. This was a similar growth percentage to the previous year, although 13% of this growth, i.e. 39 new members could be linked to the marketing campaign, as they signed up to a car sharing service directly through the campaign website. No vehicle usage statistics or cost/benefit information was provided. None-the-less, this project indicates that the combination of a consumer community platform which promotes sustainable projects by bringing people together (i.e. a bottom-up approach), when operated in conjunction with a communications campaign or agency from the top-down, could be beneficial.

4.2 CAR POOLING

Two of the 13 measures in this cluster relate to car pooling. A summary of the outputs and impacts is given in Table 4.2.

Table 4.2 Achieved Outputs and Impacts for car pooling

City	No.	Outputs	Economy Energy Environment	Transport	Society	Comments
Craiova	M06.04	<ul style="list-style-type: none"> • Scheme demonstrated the potential of car pooling in Romania • New car pooling parking area created in Western industrialised area, near to RAT company headquarters 	<ul style="list-style-type: none"> • Scheme estimated to have saved 6190 veh kms over 2 months, equivalent to 712 litres of fuel (assuming a burn rate of 11.5 l per 100kms) • Reduction in congestion and pollution claimed, but details not stated (as limited time given for assessment) • Economic benefits not quantified 	<ul style="list-style-type: none"> • Take up of 122 employees (out of 224 invited), split into 33 car pool groups • Average vehicle flow and demand for on-street parking nearby said to have reduced, but no details given 	<ul style="list-style-type: none"> • All those involved in car pooling knew about the scheme (compared to 70% of employees surveyed before) • More employees apply to use the service than there are reserved spaces in the parking lot 	<ul style="list-style-type: none"> • Energy/environmental indicators based on fuel and km saved are good • Awareness data are based on survey sent to 214 employees in 2010, and 122 car poolers in November 2012 - It is not clear how many people responded
Perugia	6.1	<ul style="list-style-type: none"> • New car pooling parking area established at University of Perugia, with barrier entry 	<ul style="list-style-type: none"> • Emissions and environmental impacts said to be unquantifiable (assessment of success is based on increased vehicle occupancy, awareness and acceptance levels only) 	<ul style="list-style-type: none"> • Average vehicle occupancy in Faculty of Engineering car park increased from 1.17 to 1.25 (increase of 6.5%) 	<ul style="list-style-type: none"> • 21% of University employees interviewed converted from driving to other means of transport, of which 9% claimed to have discovered the advantages of car pooling (the other 8 and 4% converted to bus and the park and ride solution using the Minimetrò line respectively, as discounted public transport tickets were also introduced) 	<ul style="list-style-type: none"> • Employee survey data seems good (N=220), although respondents were weighted towards males in the 40-49 age group • No data on energy/environmental impacts or for cost/benefit analysis

The Craiova scheme was estimated to have saved about 6,190 vehicle km over the pilot period of two months, based on the average trip lengths taken by the employees, and the number of expected trips that would otherwise have been taken. This is equivalent to some 712 litres of fuel saved, assuming an average consumption of 11.5 litres per 100km. (This consumption rate was derived from face-to-face interviews with RAT employees.)

The project also claimed there were reductions in average vehicle flows, congestion and pollution, as well as in the demand for nearby on-street parking, although no evidence was

provided to support this. Nevertheless, RAT ended up with more requests from employees applying for the service than there were reserved spaces in the parking area. At the end of the pilot, 122 RAT participants had signed up to taking part in the scheme, representing over 50% of the 224 employees based at the headquarters site. This scheme was viewed as a success, and the Municipality was said to intend to offer this service to other industrial companies in other parts of the city.

For *Perugia*, the assessment of success was based principally on the estimated increase in vehicle occupancy, supported by some awareness and acceptance level indicators. No emissions and environmental impacts were given, as these were said to be unquantifiable. The University enlarged the reserved parking area devoted to car poolers, from 50 to 100 spaces. This resulted in some delay, and the associated relocation of the barrier. However, once the scheme was in place, the average vehicle occupancy in the Faculty of Engineering car park was said to have increased from 1.17 to 1.25 on average, or by 6.5%. The average occupancy of 1.17 for 'normal' cars was obtained from data supplied by the Automobil Club Italia for Perugia. The increased value was calculated from the total number of occupants arriving in the Faculty car park, from a total of 1,200 free parking spaces (including the 50 pooled spaces), and assuming an average of 3 occupants for the pooled cars, and 1.17 for vehicles in the other spaces. In practice, the pooled vehicle could have had even higher occupancy, as could the 'normal' cars parked in the other free spaces. These values are therefore likely to be underestimates, assuming the car park is always full. This was said to be the case normally, as the free spaces could be used by all 3,400 students of the Faculty, as well as the employees. It was also considered usual that a small proportion of the pooled vehicles would reach the Faculty each day, and not find a reserved pooled space to park.

An on-line questionnaire was sent to the University employees both before and after the scheme. Some 220 people responded to the ex-post questionnaire, covering both genders and a range of ages, although respondents were mostly male (61%), and aged between 40 and 49 (51%). 21% of those interviewed said they had converted from using the private car to other modes of transport. Of these, 9% claimed to have discovered the advantages of car pooling, while 8% converted to buses, and 4% to the park and ride solution using the Minimetrò line (or Automated People Mover system). In addition to car pooling, the migration to public transport was explained as being due to discounted tickets, following an agreement between the University and Minimetrò. Cheaper costs had been cited as an important factor for University employees to take public transport.

4.3 OUTCOMES

A series of key messages for the successful establishment and/or continued operation of car sharing and car pooling systems can be discerned from the evidence provided by the cities in the CIVITAS Plus programme.

The case for alternative car use schemes

The experience from Brescia and the assessment conducted in Coimbra suggest that new car sharing schemes can be successfully implemented to reduced private car use and deliver other economic and environmental benefits. Previous research suggests that the appetite to develop car sharing schemes is increased through the engagement and support of principal stakeholders, such as the city or municipal authority (to provide political, legal or financial support), and the local public transport operator (e.g. to provide smartcard integration and convenient interchanges across different modes). This is also borne out by the CIVITAS Plus projects. The start-up costs can also be reduced through the inclusion of municipality-owned

vehicles as part of the car sharing fleet, and scheme take-up is in turn increased by the inclusion of the local authority or government as customers. The introduction of a high proportion of clean or electric-powered vehicles from the outset is particularly valuable.

The experience from Perugia and Craiova show new car pooling measures can also be successful in reducing private car use, when they are generated by the city or municipal government in response to a recognised demand for these services.

However, the success of all alternative car use schemes can be variable, as the experience from Donostia-San Sebastián and previous CIVITAS studies have shown. Many other factors must be considered, including the following:-

i) *Continued need to increase awareness and promotion*

Despite some successes, and consistent with previous studies, the general awareness of alternative car use schemes in the CIVITAS cities was relatively poor. The experience from Donostia-San Sebastián, as with previous CIVITAS findings, suggests that additional marketing and/or promotion is necessary to attract private users and businesses to the new services. Intervention by the city or municipal authority (in conjunction with the local scheme provider) should be a prerequisite if alternative car use schemes are to be successful.

ii) *Incentivising Users*

In some European cities, e.g. Bath, specific circumstances such as space constraints, congestion levels, cost/shortages of parking spaces, and factors such as high cost of car ownership (e.g. for insurance and/or high taxes in new cars) can make alternative car use schemes very attractive to users. However, where such driving factors are absent, alternative car use can be met with limited success for both companies and private users, even where strong promotion and endorsement through different communications channels have been provided. This was the case in Aalborg. In these circumstances, additional incentives or financial motivations are required to develop a successful car sharing or pooling scheme. In Gent, for example, prospective users were offered limited free trials to encourage them to try out the car sharing service. This resulted in an increase in the number of subscribers for the short to medium term.

iii) Community engagement and ‘word-of-mouth’ promotion

However, as shown in Monza, free trials in themselves may not be self-sustaining in the long term, and additional measures that engage the community are required to support the continued use or growth in car sharing and pooling. This has not been clear from previous studies. Moreover, the evidence from Gent (and initial indications from Utrecht) suggest that engagement of the local community in determining e.g. the car sharing locations (through a ‘vote for a car sharing station in your neighbourhood’ initiative in the case of Gent), and using other ‘word-of-mouth’ communications measures are more effective in promoting and sustaining alternative car use. Such measures could include home social sessions (e.g. ‘coffee and cake time’) to introduce people to the services, as well as the appointment of local ‘client ambassadors’ to advocate their use. This is an important finding from CIVITAS Plus, and should be highlighted to future schemes.

iv) Consider need from business subscribers

Successful car sharing schemes in this cluster have courted both business and private participants, as their hours of use tend to be complementary. (Business users tend to require vehicles between 9am and 5-6pm during weekdays, whereas the demand from private individuals tends to peak in the evenings and at weekends.) Targeting business customers in addition to individuals not only increases subscriber volume (often several fold), but also optimises the use of vehicles during any 24-hour period. However, the experience from Gent shows that business users also have specific requirements which need to be met, such as ‘pool’ smartcards for their employees to access shared vehicles. This finding of CIVITAS Plus supports results that have been found previously that effective car sharing usually involves tailoring solutions to specific subscriber bases. Similarly, previous research has indicated that company employees can provide a high source of demand for car pooling schemes. This is supported by the Craiova and Perugia examples in this Cluster. Car pooling seems particularly effective where large businesses are located in suburban areas with limited car parking and/or where they are not well-served by public transport. The inherent demand from these businesses, which includes universities and public utilities, increases the potential for success in car pooling, which in turn is said to be successful in reducing traffic congestion and pollution.

v) Importance of effective collaboration

Typically, stakeholders are involved in developing and implementing alternative car use schemes. The measures have highlighted the importance of effective cooperation. The taxi-sharing experience from Gent shows that, where partners do not cooperate, the scheme is likely to fail from the outset, even if the city or municipality is willing to initiate and promote the scheme.

vi) Upgrading car sharing schemes

As well as enlarging a service, upgrades of existing car sharing schemes should also involve the deployment of more environmentally friendly vehicles (i.e. adaptation to more technical state-of-the-art). As shown by both the Bath and Bologna CIVITAS Plus projects, changing from petrol to more environmentally ‘clean’ fuel vehicles can make further contributions to reducing pollution and emissions, as well as in demand.

vii) Take-up of the services

There is evidence of considerable potential for car pooling and car sharing services to reduce vehicle mileage in urban areas. However, the success of the measures varied with specific local circumstances such as space constraints, cost/shortages of parking spaces, and factors such as the high cost of car ownership (e.g. insurance and/or high taxes for new cars). Levels of take-up of the services have generally been rather low and costs not recovered. Key to overcoming this is the development of a clear strategy in a policy framework and applications of new technology to increase service quality and reduce service running costs.

Usefulness of impact evaluations

While nearly all the cities in this Cluster provided some results, which were useful in their given context, it is evident that several projects did not devote sufficient resources into determining their 'Baseline' and 'Business-as-usual' situations beforehand, e.g. through surveys to determine existing user awareness, and were therefore unable (or found it difficult) to provide 'before-and-after' comparisons of the benefits to be derived from alternative car use schemes. Where a city did devote resources to establishing the data for these scenarios, as in the case of Bath, more meaningful and rigorous impact results were obtained as a consequence.

5. UPSCALING AND TRANSFERABILITY

5.1 INTRODUCTION

Up-scaling refers to the potentials for a measure (or group of measures) to be expanded more widely across a city. Several factors need to be considered for up-scaling. For example, there are likely to be geographical/location constraints and perhaps capacity limitations. In addition, a measure practically possible may well be affected by what would be politically acceptable. In the CIVITAS evaluation, all cities were encouraged to assess upscaling taking above factors into consideration.

A main objective of the transferability analysis is to assess whether the success of measures in a city are dependent on any particular conditions, and whether the success achieved and the lessons learnt in one city can be transferred to other cities. Successful implementation of a measure or a package of measures in a given city should provide ground for transferring the experience to other cities, if the right conditions are met. Transferability addresses the possibility of transferring/adopting in a given city successful measures.

5.2 UPSCALING

The success of the deployment of hybrid vehicles in Bath, despite higher leasing costs, shows the potential and benefits of deploying these vehicles across an enlarged car club's fleet. This was hinted at in previous CIVITAS projects, but this review shows similar benefits have been found also in Bologna through the deployment of more ecological vehicles in a car sharing scheme, and the use of alternative-fuel vehicles should therefore be encouraged in any potential upscaling of projects in future. In contrast, the use of the internet, social media and viral marketing to attract younger people to car sharing schemes appears to have negligible effect where other (more underlying) financial factors such as high car ownership costs, and other disincentives such as car parking charges, are absent.

The success of the two car pooling schemes suggests there is further appetite to expand these services to further companies, universities and public bodies, where the availability of on-site parking is limited (or needs to be reduced), the location is less central or not conducive to walking and cycling, and access to public transport is limited. This supports the findings from earlier CIVITAS projects. A summary of the potential for upscaling is given in Table 5.1.

Table 5.1: Upscaling and Transferability possibilities

City	No.	Upscaling
(a) Car sharing		
Aalborg	53	The target group for the campaign is limited to students with a limited need for transport by car, who are settled in the areas covered by the existing system. This measure should not be up scaled, as it has no positive effect, and the scheme and campaign already reflects the maximum extent of a car sharing scheme in Aalborg.
Bath	6.3	Results are already being upscaled by City Car Club, as the Toyota Prius has now become an important part of their fleet, U.K.-wide

City	No.	Upscaling
Bologna	6.1	Potential to: <ul style="list-style-type: none"> • Upscale the scheme further, to increase/reach more locations, and differentiate car types to meet different user needs • Introduce personalised fares and further services (e.g. provide other channels in addition to web and call centre)
Brescia	M06.05	<ul style="list-style-type: none"> • Scheme in Brescia already available to ICS subscribers located in the rest of Italy • Fleet may be used out of the city, although must be returned to hired location • More vehicles/locations may be added in future, if required
Coimbra	M06.03	Intention to implement the car sharing scheme as assessed, so no plans to extend beyond that, although greater benefits would be derived if more vehicles were deployed
Donostia-San Sebastián	56	Potential to upscale to whole city, but this is dependent on success and public acceptance of current measure (an extensive promotional campaign is said to be in progress)
Gent	6.2	Reported as N/A
Gent	2.3	Taxi sharing scheme cancelled
Monza	61	<ul style="list-style-type: none"> • Potential to upscale, but will not necessarily be successful if service is extended to some areas of the city, e.g. Districts 4 and 5 • Upscaling will need to address funding issue and difficult problem of illegal parking by other vehicles in car sharing spaces
Perugia	6.2	To be reported by project (at time of writing)
Utrecht	6.2	Campaign can be launched outside of Utrecht - if successful
(b) Car pooling		
Craiova	M06.04	Municipality intends to develop measure for other companies from the Western industrial area, and then to other parts of the city
Perugia	6.1	<ul style="list-style-type: none"> • University expressed interest to enlarge car pooling area from 50 to 100 spaces, and is considering applying charges to remaining car parking area as a deterrent to private car users • Scope to open Fi-Start web portal to users from other public bodies, and eventually the general public

5.3 TRANSFERABILITY

One of the goals of the process evaluation was to develop specific recommendations on the transferability potential of a measure to other cities and recommendations to improve the process around the measures. Looking at the results it has to be concluded that both types of recommendations to a large extent have been mixed. In practice most recommendations are related to how the measure process could be better organized in other cities. Actually, the recommendations on transferability became more or less a warnings of pitfalls, often related to the barriers and drivers.

A simplified overview of the recommendations as mentioned by the measures is given in Annex 4 shows. It can be seen that recommendations on transferability and process often overlap. Regarding the findings on the barriers and drivers, it is unsurprising that increasing awareness and involvement is seen as a major condition for transferability and process improvement. It was mentioned as such by 54% and 77% of the measures respectively. Almost one third (31%) of the measures mentioned that a well performed analysis before starting the measure would help to recognize the suitability of the measure in specific circumstances. According to 31% of the

measures the process around alternative car use measures should be politically supported, including adjustments of legislation.

The recommendation on political support is rooted in the fact that alternative car use implies a paradigm shift from car ownership to car use. Such a paradigm shift is not easy to accomplish and usually requires profound changes. Not only in people's mind, but also in terms of organisation and legislation. Therefore, in theory, this type of measure is transferable to other cities (every city likes to come up with new ideas, new programs, etc.), but to initiate them and to conduct them properly is not easy and requires a number of important conditions to be taken into account. These conditions can be divided into three levels. The first level is the strategic one. This implies that political support is essential for this kind of measures aiming at a change of the dominant culture of 'having a car for my own'. A vision of sustainable mobility may act as an important financial and institutional framework for car sharing and carpooling as in the case of Perugia for example. Furthermore car sharing and carpooling are not to be seen as stand-alone initiatives, but have to be imbedded in an overall urban mobility system. At the tactical level it is important that impeding institutional regulations and legislations are adjusted. An example of this is found in Bath, where the process of getting permission for on-street parking has been speeded up. At this level it is also important that there is awareness of the alternative use of cars, by citizens and also of other possible stakeholders, such as businesses, parking companies, software developers. At the operational level it is important to clear spatial barriers. For example the availability of suitable parking lots with special services like recharging points for vehicles. Other important conditions are proper arrangements on the division of investments and revenues and well-functioning technology, like in Craiova where the software to support the car-poolers functioned well and acted as a driver for the measure.

6. RECOMMENDATIONS

From the conclusions of the work with the CIVITAS PLUS projects, the following recommendations are made:

- i) City or municipal authorities should ensure they are pro-active in promoting (or continuing to promote) alternative car use schemes, as marketing and promotion are prerequisites for the attraction of private users and businesses to these services.
- ii) Where congestion, space constraints and other urban driving factors (such as high parking charges) are absent, the administrators or operators of alternative car use schemes should provide financial incentives or other motivations such as free trials to attract additional users, as promotion and endorsement alone may be insufficient in these cases.
- iii) Promotions through ‘word-of-mouth’ and strong community engagement, including the use of local ‘client ambassadors’ or ‘nudgers,’ are more effective in sustaining usage of car sharing schemes for the long-term. Administrators of such schemes should consider for example, engaging the local community to introduce people to these services and in determining the car sharing locations, which can deliver sustained benefits over traditional ‘top down’ promotional campaigns.
- iv) Car sharing schemes should target business users as well as private individuals, as this increases both the utilisation of vehicles across different time periods, and the number of subscribers. However, these schemes will need to improve the business offering according to user needs, for example in providing a corporate ‘pool’ card. Similarly, city or municipal authorities should consider targeting businesses located in suburban areas, which have limited parking or that are not well-served by public transport, for potential carpooling schemes, as these provide a high source of demand.
- v) As with previous CIVITAS findings, scheme administrators or developers should ensure that all project stakeholders are engaged (and committed) to the deployment of alternative car use schemes.
- vi) Car sharing schemes should deploy more environmentally friendly vehicles where possible, as these help to reduce pollution and emissions as well as private car demand. The higher leasing cost incurred for these vehicles can be offset by lower fuel consumption costs.
- vii) A sound feasibility study is essential before starting measures in the field of alternative car use. This should contain topics such as possible target groups and their culture, possible participants (frontrunners) and their interests, spatial requirements, equipment needed, business models, and possible positive and negative effects.

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- (7) Civitas Renaissance projet: Final Evaluation Report 9 (Draft version), 2013

ANNEX 1: Overview of barriers, drivers and actions fields

Overview of barrier fields and examples

NR	Barrier field	Examples of barriers
1	Political / strategic	Opposition of key actors based on political and/or strategic motives, lack of sustainable development agenda or vision, impacts of a local election, conflict between key (policy) stakeholders due to diverging beliefs in directions of solution
2	Institutional	Impeding administrative structures, procedures and routines, impeding laws, rules, regulations and their application, hierarchical structure of organizations and programs
3	Cultural	Impeding cultural circumstances and life style patterns
4	Problem related	Complexity of the problem(s) to be solved, lack of shared sense of urgency among key stakeholders to sustainable mobility
5	Involvement, communication	Insufficient involvement or awareness of (policy) key stakeholders, insufficient consultation, involvement or awareness of citizens or users
6	Positional	Relative isolation of the measure, lack of exchange with other measures or cities
7	Planning	Insufficient technical planning and analysis to determine requirements of measure implementation, insufficient economic planning and market analysis to determine requirements for measure implementation, lack of user needs analysis: limited understanding of user requirements
8	Organizational	Failed or insufficient partnership arrangements, lack of leadership, lack of individual motivation or know-how of key measure persons
9	Financial	Too much dependency on public funds (including CIVITAS funding) and subsidies, unwillingness of the business community to contribute financially
10	Technological	Additional technological requirements, technology not available yet, technological problems
11	Spatial	No permission of construction, insufficient space
12	Other	???????????

Overview of driver fields and examples

NR	Driver field	Examples of drivers
1	Political / strategic	Commitment of key actors based on political and/or strategic motives, presence of sustainable development agenda or vision, positive impacts of a local election, coalition between key (policy) stakeholders due to converging (shared) believes in directions of solution
2	Institutional	Facilitating administrative structures, procedures and routines, facilitating laws, rules, regulations and their application, facilitating structure of organizations and programs
3	Cultural	Facilitating cultural circumstances and life style patterns
4	Problem related	Pressure of the problem(s) causes great priority, shared sense of urgency among key stakeholders to sustainable mobility
5	Involvement, communication	Constructive and open involvement of policy key stakeholders, constructive and open consultation and involvement or citizens or users
6	Positional	The measure concerned is part of a (city) program and/or a consequence of the implementation of a sustainable vision , exchange of experiences and lessons learned with other measures or cities
7	Planning	Accurate technical planning and analysis to determine requirements of measure implementation, accurate economic planning and market analysis to determine requirements for measure implementation, thorough user needs analysis and good understanding of user requirements
8	Organizational	Constructive partnership arrangements, strong and clear leadership, highly motivated key measure persons, key measure persons as 'local champions'
9	Financial	Availability of public funds (including CIVITAS funding) and subsidies, willingness of the business community to contribute financially
10	Technological	New potentials offered by technology, new technology available
11	Spatial	Space for physical projects, experimentation zones
12	Other	???????????

ANNEX 2: Background information General Overview

Focussed / non focussed measures and quality ratings of process evaluation

	Low quality	Medium quality	High quality	Total
Focussed	1	0	1	2
Non focussed	1	5	5	11
Total	2	5	6	13
	Low quality	Medium quality	High quality	Total
Focussed	8%	0%	8%	15%
Non focussed	8%	38%	38%	85%
Total	15%	38%	46%	100%

Innovative aspects

Innovative aspect	Cluster Yes	Cluster No	Total Yes	Total No
Innovative aspects				
Conceptual	62%	38%	48%	52%
Innovative aspects New Technology	46%	54%	45%	55%
Innovative aspects New mode of transport	38%	62%	13%	87%
Innovative aspects Targeting specific users	62%	38%	39%	61%
Innovative aspects economic instrument	8%	92%	5%	95%
Innovative aspects policy instrument	23%	77%	17%	83%
Innovative aspects organizational	23%	77%	25%	75%
Innovative aspects Physical infrastructure	23%	77%	19%	81%
Innovative aspects other	23%	77%	5%	95%

Targets

Strategic Target	Number	Percentage
Reduce environmental impact	7	54%
Modal shift	5	38%
Introduce innovative mobility services	4	31%
Decrease traffic in city centre	3	23%

Tactical Target	Number	Percentage
Alternative private car (e.g. car sharing/car pooling)	7	54%
Energy efficient vehicle use	3	23%
Integrate PT in trips	2	15%
Reduce congestion	1	8%
Investigate to achieve a better understanding of barriers to car sharing	1	8%

Operational Target	Number	Percentage
Implement car sharing and/or car pooling	8	62%
Decrease private car use	2	15%
More PT usage	2	15%
Taxi sharing	1	8%
Study implications of a car sharing service	1	8%

ANNEX 3: Drivers and barriers per phase

Fields	Barriers			Drivers		
	Preparation	Implementation	Operation	Preparation	Implementation	Operation
Political	8%	0%	0%	46%	0%	0%
Institutional	15%	23%	15%	0%	0%	8%
Cultural	8%	31%	8%	15%	8%	8%
Problem related	0%	8%	8%	15%	15%	8%
Involvement	23%	0%	0%	23%	15%	31%
Positional	0%	0%	8%	15%	8%	0%
Planning	15%	8%	8%	15%	8%	0%
Organizational	38%	23%	8%	23%	23%	0%
Financial	23%	23%	23%	23%	23%	8%
Technological	31%	8%	8%	8%	23%	0%
Spatial	8%	23%	15%	0%	15%	0%
Other	8%	0%	0%	0%	0%	8%

ANNEX 4: Background information recommendations

Transferability

Transferability	Number	Percentage
Analyse situation before start	4	31%
Increase awareness and involvement potential users	7	54%
Find optimal location for shared car parking	2	15%
Have a good (financial) planning	3	23%
Make sure the car sharing system works	2	15%
Offer a trial period	2	15%
Can be used as showcase innovation	2	15%

Process

Recommendations	Number	Percentage
Increase awareness and involvement potential users	10	77%
Political and legislation support	1	8%
Good planning/action plan	2	15%
Find integration possibilities	4	31%