

GUIDELINES FOR IMPLEMENTERS OF **Electric Cars in Car Share Clubs**



What is it about?

Characteristics

City Car Share Clubs are now well established. They encourage: increased vehicle sharing; a reduction in the number of privately owned cars; and a proportional reduction in the number of parking spaces needed.

Electric vehicles are clean, green and quiet. There is a growing consensus they are the best near-to-market low emission vehicle technology with no emissions at 'point of use', 'well to wheel' CO₂ emissions typically 30-40% lower, and fuel costs typically 60-70% lower than comparable petrol or diesel-fuelled vehicles.

Electric cars offer obvious advantages over conventional petrol or diesel cars in city environments. Parking spaces are needed around the city, where vehicles can be picked up and dropped off, and recharged.

Key Benefits

A City Car Share Club using electric vehicles offers:

- savings for users who share the costs of car ownership;
- a new public transport (PT) opportunity with greater flexibility for users, especially at times when other modes are not running;
- a complement to existing PT systems by providing the first or last leg of a journey, with integrated ticketing solutions;
- reduced private cars on the roads, and hence less traffic;
- reduced congestion and delays;
- less pollution i.e. emissions and noise, due to less traffic and use of electric vehicles;
- reduced requirement for parking spaces, with the opportunity to reclaim the land for other uses;
- more sustainable transport and improved quality of life in the city.

Communauté
d'Agglomération de
La Rochelle



Photos: La Rochelle

Good Practice: La Rochelle, France

The first electric car share club was the Liselec scheme in La Rochelle, France, which has operated since 1999. It provides 50 electric cars (25 Peugeot 106s and 25 Citroen Saxos), parked in seven recharging stations near high use locations in the city, such as the main train station, the bus station and the university.

The cars are available for pick-up round the clock, every day of the week. Users must have a driving licence in order to take out a subscription. In exchange, they receive a pass unlocking any of the 50 cars. Subscribers pay for car hire according to the usage time and mileage totalled during the month.

Users can leave the cars at any recharging station, so they effectively have free parking in the city. The scheme operator must redistribute the cars if necessary at the end of the day.

The scheme is soon to be upgraded with more recharging stations to help attract more users, and then again when the new generation of electric vehicles becomes available.

Is this something for us?

Electric cars in car share clubs provide a new public transport opportunity offering personal transport and personal empowerment. Car sharing effectively provides combined mobility and mobility insurance, and serves complex trips, while the use of electric cars contributes more strongly to sustainability and quality of life policies.

Schemes encourage people to re-think their travel choices by reducing ownership, so that the car is no longer the default option.

They reduce the need for parking spaces and so free up land for other uses which may be for commercial or amenity purposes.

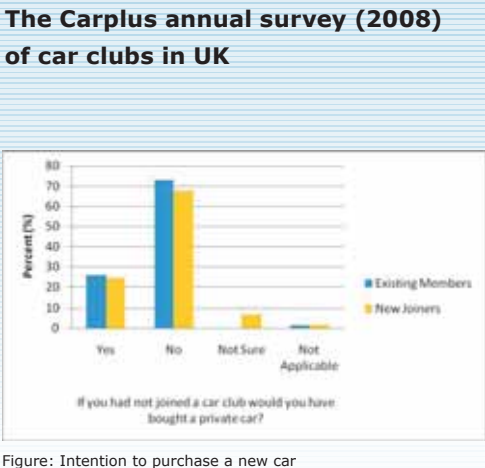
Check list	
City size	Bigger cities will generally need more vehicles, but start-up schemes can be small and local.
Costs	Capital costs are needed to provide electric cars, parking and recharging stations. These can be recovered through charges. Public private partnerships are possible.
Implementation time	Short term: schemes can be established within 2-3 years.
Stakeholders involved	<ul style="list-style-type: none"> City authority to promote scheme and provide parking/charging stations; Electricity supply company to provide charging units; Operating company to procure vehicles and manage operations; Car sharing initiatives are generally aimed at both residents and businesses.
Undesirable secondary effects	<ul style="list-style-type: none"> Electric cars are more expensive currently, although this will change; Charging infrastructure required; Vehicle down time due to re-charging, although faster charging technology is becoming available; Concerns that quiet electric cars might lead to more accidents are not supported by the evidence from La Rochelle.

The Carplus annual survey (2008) of car clubs in UK reports:

- around a quarter of both members and joiners report that they would have purchased a new car had they not joined a car club;
- 39% of all respondents have reduced the number of vehicles owned by their household since joining a car club;
- each car club car is estimated to result in an average of 13 private vehicles being sold and a further 9 not being purchased.

“TfL research shows that car share schemes result in increased use of public transport. The complementary role of car share clubs to public transport policy is accepted for London, but is not so everywhere.”

David Rowe, Transport for London



Benefits & Costs

Benefits

Car share schemes increase the flexibility of the public transport (PT) offered in a city and provide quality of life benefits of their own which are enhanced by using electric powered cars. The benefits include:

- improved accessibility for 'the last leg' of a trip and especially at times when and to places where public transport is not running;
- mode shift: Carplus club members in the UK make more trips by PT and walking or cycling, and considerably fewer trips (16-23%) involving a car, lift, taxi or motorbike compared with non-members (66%);
- reduced congestion: members typically reduce their driven mileage by 36%;
- reduced environmental impacts: from reduced mileage, and from using clean, quiet vehicles.

Users save by sharing the costs of car ownership which include not only the cost of the vehicle but also tax, insurance, maintenance, and (of growing importance) the cost of parking.

Costs

Costs are associated with the provision, and subsequent maintenance of the electric vehicles, a back-office system for handling charges and membership, and with the provision in the city of an infrastructure of parking spaces equipped with facilities for re-charging the electric vehicle's batteries.

All the components of a scheme may be procured directly by the city, as in the case of Paris; although an electricity supply partner would be likely to quote favourable rates for their role in anticipation of the electricity to be sold.

Costs, and risks, to the public authorities may be further reduced using the private finance initiative (PFI) model chosen by London. In this, Transport for London (TfL) with an electricity supply partner, provided the parking spaces and charging facilities, while consortia were invited to provide and operate the vehicles and car share clubs.

Extract from CAR2READ, the web magazine of car2go

"Since a system like car2go is predestined to use electric vehicles, car2go will also be more intelligent, for example with regard to distribution of vehicles throughout the operating area, or with regard to the vehicle reservation process. ...We at car2go speak of car sharing 2.0 today, and I think in ten years we'll see a '3' in front of the decimal point."

Helmuth Ritzer, employed by Daimler in the "business innovation" department in Stuttgart, Germany, and head of IT and telematics (in-car communications) for car2go

The Autolib Electric Car share scheme in Paris, France

In June 2008, mayor Bertrand Delanoë announced that procurement of the Autolib electric car share scheme would begin in 2009. A public opening is planned in June 2011 when the scheme is about 50% complete, with full completion expected by the end of that year. The full scheme will involve about 1000 charging stations, 700 in Paris and 300 in the suburbs, with an average capacity of 6 cars. That will provide a total of about 6000 parking lots to cater for a planned fleet of 3000 electric vehicles.

A driver will be able to pick up a car, for example in the east of the city, and drop it off in the west after a short journey. A computerised system will enable the driver to reserve a parking space at the drop-off point. Members are expected to be charged a monthly subscription fee of around €15 plus €4 per 30 minutes of driving, including the costs of insurance and 'fuel'.

Users & Stakeholders

Users and target groups

The users of a car share scheme are people who can drive, but choose not to own a car. Their main requirements are for:

- **availability:** to have a vehicle pick-up point close to their home or office;
- **booking / reservation:** to have a simple system for reserving a vehicle, and in a multi-port system, reserving a parking place at the destination port;
- **payment:** to have a simple means for charging and payment;
- **ease of use:** to have a system that is simple to use with ease of access;
- **performance and range:** to have a vehicle that has acceptable acceleration and speed, and range before it needs recharging;
- **costs:** to be reasonable, and substantially less than car ownership;
- **flexibility:** regarding where the vehicle can be left and recharged. This requirement will determine whether a single or a multi-port scheme is to be provided.

Two options for a scheme are possible, and must be decided at the outset:

- a multi-port scheme in which one-way trips are possible and cars can be left at the end of the trip (e.g. as in La Rochelle, Ulm, Paris). In this option, more parking spaces are needed than cars, together with a system for relocating cars at the end of the day;
- a single-port scheme in which only round trips are possible (e.g. as in Amsterdam, London, Edinburgh, Boston). In this option, the cars must be returned to the pick-up point and only as many parking spaces as cars are needed.

Key stakeholders for implementation

The core team consists of:

- **local authority** as the owner of the street network and parking spaces, and possible scheme promoter;
- **transport interchanges** (e.g. rail terminal, airport etc.) and other major facility operators as the likely pick-up / drop-off points for vehicles;
- **owner / operating company** to design, operate and promote the scheme, i.e. organise membership and records, issue bills, handle payments, arrange for vehicle procurement and maintenance, and relocation etc.;
- **back-office systems provider** if required;
- **electricity supplier** to provide on-street charging facilities at the parking locations;
- **contractor** to design and implement the parking / charging locations and signage etc.

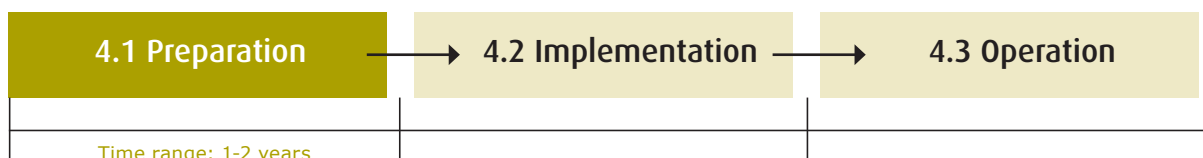
Other groups that should be consulted include:

- local community, i.e. residents and businesses;
- press / media;
- user groups of other road users, e.g. pedestrians, cyclists, children, people with special needs;
- taxi operators and local PT operators;
- tourism offices.

A strategy to market and promote the car share club to potential users will be needed, and can be supported by policy measures such as preferential or free parking for electric car share vehicles and awareness campaigns.

From concept to reality

Preparation



A proposal for a car share scheme using electric cars will usually arise as a consequence of a city's plans to develop a more sustainable and less private car dependent transport environment.

The initiative may come from the city e.g. the mayor, or from a car share club. Either way, planning will usually start with a feasibility study to confirm the likely level of demand and the viability of the scheme.

Key aspects at this stage

- Electric car share club proposed in recognition of the quality of life benefits for the community;
- Feasibility study to confirm the likely level of demand and the viability of the scheme;
- Produce scheme specification and layout;
- Work to win necessary media and stakeholder support;
- Develop business case and funding mechanism;
- Prepare/publish Invitation to Tender (ITT)
- Receive/evaluate tenders;
- Select contractor/consortium.



Photo: Transport for London

Creating political support

Car share clubs are not yet on the agenda of many city planners. However, they have much to offer. A champion will be needed who can take plans forward and win the support of local politicians.

Feasibility Study

Experience elsewhere shows a number of factors need to be in place for a successful scheme. Large cities will often have the capability in-house, but smaller cities may use consultants to help determine success factors, estimate demand, develop a scheme outline, identify the barriers and how to overcome them, show expected costs/benefits, and generally confirm the proposal is economically viable. However, if the initiative comes from a car share scheme promoter, this role may be undertaken by them.

Stakeholder network

It will be helpful to win the support of local residents and businesses as well as the owners of the facilities where vehicle parks are planned. It is therefore suggested to involve the media and establish user groups to inform them of the benefits and progress, and to learn their views and opinions.

Scheme/system specification

Depending on capability, work will be required in-house or using (the same or different) consultants to develop the results of the feasibility study to provide a scheme specification.

Business case

This may be determined by the scheme promoter, or the city may commission a separate business case if it is proposed to involve private funding, and to invite tenders to provide the scheme.

Prepare/publish Invitation to Tender Standard procedures should be used to prepare and invite tenders, to evaluate them and select the successful consortium. The steps are:

1. prepare and publish an Invitation to Tender (if it is intended to procure the system directly) or an Invitation to Participate if a Private Finance Initiative (PFI) is proposed;
2. receive/evaluate the responses and enter into competitive dialogue if required;
3. select contractor/consortium and prepare to award contract or, in the case of a PFI, a consortium partner position.



Photos: Transport for London

Electric car share scheme in London, UK

"It is essential for public authorities to have agreements in place with commercial operators, covering issues such as vehicle type/age, customer service requirements, information sharing, marketing, maintenance, expansion, etc.

Legal/constitutional issues are not significant barriers, the precedent has been set by other cities who are happy to share relevant documents. This is obviously very helpful for transferability. The London partnerships model is taken from the Edinburgh scheme."

David Rowe, Transport for London

Note that it is important to have partnership agreements in place with commercial operators to cover performance aspects of a scheme, including:

- vehicle type/age and maintenance;
- customer service requirements;
- information sharing;
- marketing, maintenance;
- expansion.

Partnership agreements provide a guarantee of service to users. They should be evaluated using appropriate performance indicators, and break clauses should be included for poor performance.

Examples of partnership agreements have been set by other cities who are generally happy to share documents (see box "Electric car share scheme in London").

Ready for implementation? ✓

Political support and champion in place

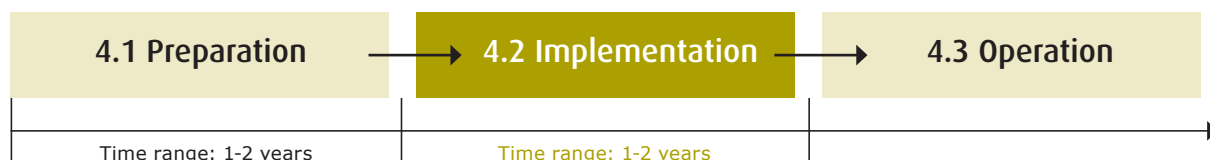
Feasibility proven

Stakeholders supportive

Business model decided and means of funding available

From concept to reality

Implementation



Following selection of the contractor / consortium, we can proceed to implementation.

Key aspects at this stage

- Put consortium and funding in place;
- Establish contract / or partnership agreement;
- Build infrastructure and back-office systems, provide vehicles;
- Train staff;
- Continue work with media and stakeholder groups;
- Do trials / tests.

Electric car share in London, UK

The City of London is actively encouraging the take-up of electric vehicles in existing car share schemes. In London, car share clubs, including the vehicles, are provided by private operators who take on most of the costs and risks of running a scheme. Transport for London reckon the extra costs of using clean vehicles reduce the Benefit to Cost Ratio (BCR) of a scheme for them from 4.1 to 2.7 for trials in which they bear the costs for parking bays and charging equipment. The BCR is still encouraging, and additional unquantifiable social, e.g. health benefits, should also be obtained.

Consortium: Decide the funding mechanism and the partners who will be involved in the consortium to provide and operate the scheme.

Establish the contract or partnership agreement: as appropriate, with the successful contractor/ consortium.

Build the scheme: there are three main components:

- the infrastructure, which includes the parking and charging locations;
- the back-office systems;
- the procurement of vehicles.

The construction of all three must be co-ordinated so the component parts can be tested individually before being brought together and tested as a complete system.

Train the operators and staff to ensure good customer relations and the safe and reliable operation of the scheme.

Continue working with **media** and **stakeholder groups** as necessary to learn their opinions and overcome problems.

Conduct **trials and tests** as needed to ensure performance requirements are met.

Problems in implementation can occur in:

- providing insurance for users (some schemes limit membership to over 21s and check driver licences);
- identifying who is liable in the event something goes wrong, e.g. with the vehicle or its availability;
- the requirement to provide parking spaces at prime locations;
- providing the critical mass of users and cars needed for a multi-port scheme such as in Paris (3,000 cars, 6,000 parking spaces in 1,000 ports) where vehicles can effectively be left anywhere, compared with the smaller number of users and cars required for a single-port scheme such as in London, where the cars must be returned to the pick-up point.

Most of the problems have been addressed by existing car share clubs, many of which are international, including:

- Car2go;
- Connect by Hertz;
- Mobility car sharing;
- Zipcar.



Citroën's C-Zero - a new electric car scheduled for production in 2010

Photo: Citroën

Extract from UK Trade and Investment web site article on a "New electric car share scheme"

Two organisations - Aston University in Birmingham and the North Birmingham & Solihull Mental Health Trust - are piloting an innovative electric car trial to help cut carbon emissions throughout the region.

They have taken delivery of the latest Smart ED (ED = electric drive), an iconic two-seater car that can simply be plugged into any mains socket.

The Smart ED emits zero pollution, travels 112 km (70 miles) on a single charge, achieves the equivalent of 482 km (300 miles) to the gallon (4.54lt) and has a top speed of 96 km (60 miles) an hour.

Aston University's Vice-chancellor, Professor Julia King, sits on the UK government's advisory committee on climate change and is among senior university staff that use the Smart car to attend regional meetings.

In 2007, she was commissioned by the government to carry out an independent assessment - the King Review - of low-carbon vehicles, to examine the vehicle and fuel technologies that could help reduce carbon emissions from road transport over the next 25 years.

Professor King said: "I believe electric vehicles and car-share schemes are a fantastic opportunity to reduce congestion, noise and pollution from our streets and the Smart ED is leading the way in alternative transport. Electric vehicles are one major way in which we can begin to use advances in current technology to help reduce the UK's greenhouse emissions. I shall look forward to using the car which forms part of Aston's Transport Action plan to promote alternative and environmentally friendly travel."

UKTI web site, updated 03 Apr 2009

From concept to reality

Operation



Following successful implementation it will be possible to proceed to full operation.

Key aspects at this stage

- Operate and maintain;
- Monitor;
- Continue work with media and stakeholder groups;
- Evaluate;
- Promote.

Operate and maintain as necessary to provide the required level of service and performance.

Continuous **monitoring** of operations is needed to ensure the system performs as required in terms of factors such as reliability, safety, usability, user satisfaction, etc.

Continue working with **media** and **stakeholder groups** as necessary to learn their opinions and overcome any problems.

Evaluation will be needed in the early days to ensure user needs and the performance specification are fulfilled, and at a later phase to confirm usability and public acceptance as well as the costs and benefits.

Continuing **promotion** and marketing may be needed to help develop and grow the system.

Note that schemes are easily adaptable to changing demand and that local schemes can be expanded to cover a region and to connect between cities.

Zipcar's iPhone App

For everybody

Find available Zipcars on a map using current, favourite or any location.

Browse car types and models.

Make your iPhone go beep beep.

For members

Reserve Zipcars around the corner or across the globe.

Find cars by time available, car type and model.

View, extend or cancel reservations on the go.

Honk your Zipcar's horn with your iPhone to find it in a crowd.

Unlock and lock your Zipcar with your iPhone after scanning your Zipcard at the start of each reservation.



The Kangoo ZE (Zero CO2 Emissions) is one of 4 new electric models scheduled for production by Renault in 2011

Photo: Renault

Further information & contacts

Further information

Carplus:

<http://www.carplus.org.uk/wordpress/>

car2go:

<http://www.car2read.com/austin/en/>

Civitas Mobilis project: http://www.civitas-initiative.org/docs/CIVITAS%20MOBILIS_bulletin_Car_sharing.pdf

Connect by Hertz:

<http://www.connectbyhertz.com/default.aspx?select=true>

Transport for London (TfL):

<http://www.london.gov.uk/who-runs-london/mayor/publications/transport-and-streets/electric-vehicle-delivery-plan-london>

La Rochelle: <http://www.yelomobile.fr/>

Mobility car sharing:

<http://www.mobility.ch/pages/index.cfm?dom=6>

Paris:

http://www.businessweek.com/globalbiz/content/aug2009/gb2009087_330677.htm

UK Trade and Investment:

<http://www.ukinvest.gov.uk/Innovation/102823/en-GB.html>

Zipcar: <http://www.zipcar.com/iphone/>

Avere: <http://www.aveve.org>

Contacts

Georges Gallais, Vulog,

e-mail: gbgallais@vulog.com

Jacques Mollard, La Rochelle, Advisor of the President of urban community for advanced transports, Vice-President AVERE, Chairman of Avere-France,

e-mail: jacques.mollard@ville-larochelle.fr

David Rowe, Surface Transport, Transport for London,

e-mail: roweda@tfl.gov.uk

Conrad Wagner, Mobility Systems;

e-mail: w@gner.ch

Jeremie Swiderek, Syndicat mixte Autolib, Technical project manager;

e-mail: Jeremie.Swiderek@paris.fr

For more information on the project, contact the NICHES+ Coordination at Polis:

e-mail: icre@polis-online.org

phone: +32 2 500 56 76

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The mission of NICHES+ is

to build on the success of the first NICHES project by stimulating a wide debate on innovative urban transport and mobility between relevant stakeholders from different sectors and disciplines across the EU and accession countries, in order to promote the most promising new urban transport concepts, initiatives and projects and transfer them from their current "niche" position to a mainstream urban transport application.

This publication is part of a series of 13 publications presenting the NICHES+ outcomes.

Photo on title page:

Kangoo ZE, Renault

Prepared for the European Commission by:



Author:
David Jeffery, TRG

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NICHES+ team

Polis (coordinator), Rupprecht Consult, Newcastle University, University of Southampton, EUROCITIES, Transman

Further information on NICHES+

www.niches-transport.org
www.osmose-os.org