



Lowering your emissions through innovation in transport and energy infrastructure

# project REPORT

# InclusivEV Policy Recommendations

Electric Car Clubs in Low Income Neighbourhoods



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## 1 Executive Summary

InclusivEV, funded by EIT Climate-KIC, was a pan-European project which aimed to test the business case and establish best practice relating to EV car clubs in low income neighbourhoods. This report describes activities undertaken at three project locations: Solihull, UK; Modena, Italy and Valencia, Spain. It presents recommendations which should be applied by organisations deploying shared mobility schemes in low income neighbourhoods. The recommendations are primarily aimed at car club providers though local authorities, providers of other mobility services and funders working in this sector will also find them useful.

Project activity consisted of:

- Market research to determine the factors required for a viable EV car club scheme.
- Site selection to identify specific bays for car club deployment.
- Installation of chargepoint infrastructure to support the vehicles.
- Consultation and community engagement to secure local buy-in for the scheme.
- Launch of the scheme in Solihull in November 2018, supported by strategic marketing and communications activity.

Unfortunately, the Solihull vehicles were subject to repeat and serious incidents of vandalism, as a result of which E-Car Club removed the damaged cars from their bays and subsequently removed all the remaining cars. In 2019 EIT Climate-KIC re-prioritised its portfolio of activities, meaning InclusivEV no longer met its programme objectives. Funding was withdrawn from InclusivEV in April 2019 and the project closed down.

InclusivEV has developed recommendations from the implementation work in Solihull and the preliminary activities in Modena and Valencia which should be applied by other organisations deploying shared mobility services in urban areas. These are summarised as follows:

- Technology choice and car club model: consider scheme designs which allow flexibility in deployment and maximise use of pre-existing assets.
- Site selection: choose car club bays which will provide sufficient levels of demand and protection of assets, and where infrastructure installation will be cost effective.
- Local authority engagement: ensure the local authority is supportive of the scheme and work with them to secure optimum bays and, ideally, user demand.
- Community and business engagement: work with community groups to develop a sense of ownership in the scheme and with businesses to identify anchor demand.
- Infrastructure installation: ensure chargepoint installation is undertaken by experienced, specialist installers.

Organisations and consortia interested in deploying mobility services in urban areas should contact Cenex<sup>1</sup> to discuss how it can help planning, implementing and evaluating successful schemes. Local authorities or businesses interested in how car sharing schemes can help cut costs and emissions should contact a supplier such as E-Car Club<sup>2</sup> to discuss their services. The InclusivEV partners wish to thank EIT Climate-KIC<sup>3</sup> for their financial and non-financial support through the lifecycle of this project.



<sup>&</sup>lt;sup>1</sup> <u>http://cenex.co.uk</u>

<sup>&</sup>lt;sup>2</sup> <u>http://ecarclub.co.uk</u>

<sup>&</sup>lt;sup>3</sup> <u>https://www.climate-kic.org/</u>

## 2 Introduction

#### 2.1 Background and Context

Convenient and affordable access to shared vehicles can reduce car ownership and use, contributing to policy objectives on congestion, air quality and greenhouse gas emissions<sup>4</sup>. Shared vehicles can also help improve access to mobility in urban areas. Benefits will be maximised when EVs are used rather than conventional petrol or diesel models.

InclusivEV, funded by EIT Climate-KIC, was a first of its kind pan-European project which aimed to test the business case and establish best practice relating to EV car clubs in low income neighbourhoods. It was a highly ambitious venture as it tackled two challenges at once: using pure EVs as car club vehicles and deploying car club schemes in low income areas.

The InclusivEV demonstrator project followed a Pathfinder project which investigated the potential for EVs to tackle transport poverty and reduce emissions in cities. The Pathfinder project published a series of guidance documents with recommendations for developing and implementing EV car clubs, which the demonstrator project aimed to test. Key findings are summarised in Section 2 of this report; for the full reports refer to the Climate-KIC website<sup>5</sup>.

#### 2.2 Car Clubs

Car clubs are membership schemes that provide access to pay-as-you-drive vehicles, typically on an hourly or daily basis. Vehicles are usually parked in dedicated parking spaces (the back-to-base model) and are accessed via a smart card or key. Scheme operators cover running costs such as insurance, tax, fuel, cleaning and servicing. Members typically pay an annual fee to join the scheme and a per hour or mile charge to hire a vehicle. Schemes tend to be located in high density, mixed residential and commercial locations with good public transport links and are often marketed towards comparatively affluent social groups. Relatively few schemes use EVs and those that do often have funding from the public sector or vehicle manufacturers.

#### 2.3 Project Partners

InclusivEV was delivered by a consortium as shown in the table below.

KIC Partner	Project Location	Role in project
Cenex, Centre of Excellence in Low Carbon and Fuel Cell Technologies	Solihull, UK	Project management, business planning, stakeholder engagement and evaluation. Production of guides and learning materials. Vehicle and infrastructure technology expertise.
E-Car Club	Solihull, UK	Investor and provider of the electric vehicles
Agenzia per l'Energia e lo Sviluppo Sostenibile, (AESS)	Modena, Emilia Romagna, Italy	Business planning and community engagement. Support with EV procurement.
University of Valencia	Valencia, Spain	Business planning and community engagement. Support with travel pattern planning and IT.
Instituto Technologico de la Energia (ITE)	Valencia, Spain	Infrastructure assessment lead and support of development of project in Valencia.

Table 1: InclusivEV Pro	oject Partners
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 <sup>&</sup>lt;sup>4</sup> Results of Carplus Annual Survey 2007-2014: http://www.carplus.org.uk/resources/annual-survey-of-car-clubs/
Executive Analysis of the Global Connected Car Market, NDF9-01, Frost & Sullivan, 2014: http://ww2.frost.com/
Global) Carsharing and Personal Vehicle Services: Worldwide Market Developments and Emerging Trends, Susan A.

Shaheen & Adam P. Cohen, Jun 2012, International Journal of Sustainable Transportation

<sup>5</sup> https://inclusivev.eu/research-results/

<sup>(</sup>US) Car-Sharing: Where and How It Succeeds, Report 108, Transit Cooperative Research Program, September 2005, available at: http://onlinepubs.trb.org/onlinepubs/tcrp/tcrp\_rpt\_108.pdf

#### 2.4 Project Objectives and Planned Outcomes

InclusivEV ran from September 2017 to March 2019. The objectives were to:

- Test the financial mechanisms, technical feasibility and community willingness to use shared EVs.
- Test and refine business models for solutions that deliver low carbon mobility and social inclusion outcomes.
- Develop new methods of engaging social housing residents in sustainable mobility.
- Identify the key behavioural change challenges related to using car sharing clubs and electric vehicles in disadvantaged neighbourhoods.
- Assess the carbon emissions and air quality benefits associated with shared EVs.

InclusivEV planned to deploy 30 vehicles in three demonstrator locations (Solihull, Modena and Valencia). The plan was to establish a successful pilot project in Solihull then launch schemes in Modena in 2019 and Valencia in 2020. Vehicles would primarily be used by local residents, with some use by businesses and public sector organisations. InclusivEV aimed to integrate EVs into the public transport system, as unpublished research by Cenex found that car clubs are more successful when deployed in areas with good public transport connectivity.

Expected outputs were:

- Deployment of shared EV schemes in three cities.
- Practical solutions that are replicable across Europe, covering community engagement and best practice business models around sustainable mobility.
- Online guides to disseminate project learnings.

# 3 Description of Activities

This section describes the activities undertaken to prepare for and launch the scheme in Solihull and the preliminary work undertaken in Valencia and Modena.

#### 3.1 Market Research

EV car share schemes must offer a desirable service for potential users and a viable business case for operators. The Pathfinder project included market research to determine the factors that make a scheme viable. We investigated residents' travel needs, how those needs were being met and whether a shared EV scheme could offer a practical alternative. Results were published in four documents<sup>6</sup> which identified factors to consider when implementing car sharing in low income neighbourhoods. Schemes should:

- Be financially sustainable and affordable for the local population.
- Be located in a catchment area with a high population density at a site which is useful, convenient and safe for local residents.
- Help meet potential users' mobility needs and offer a competitive advantage compared to alternative models of transport.
- Ensure that chargepoint placement is carefully considered.
- Use multiple community engagement and marketing channels to ensure success.

ITE and University of Valencia undertook similar preliminary work including mobility needs analysis, high level selection of potential sites, development of the business model and hub proposal, and dissemination of information to potential users.

#### 3.2 Site Selection

In Solihull, Cenex and E-Car Club identified a shortlist of 25 sites by applying the indicators defined in the Pathfinder report: population density, socio-economic deprivation and energy availability for infrastructure. We reviewed the shortlist with Solihull Metropolitan Borough Council (SMBC) to determine the final sites for implementation. Unfortunately, SMBC vetoed most of the proposed sites, citing concerns around parking and access. Ultimately, the sites taken forward to the next phase were not optimal, as they suffered from a lack of footfall and visibility and risked not generating high levels of demand. However, the project proceeded with these sites to avoid delays.

In Modena, AESS facilitated four focus groups to consult communities about the proposed scheme, gather information to feed into the delivery and engagement plan and benefit from local knowledge about potential car club bays. Next, it undertook socio-economic analysis to compare the proposed sites. The analysis assessed employment levels, education, income and age distribution. The results suggested that two proposed sites aligned with the project's aim of providing shared mobility in low income areas. The review of travel patterns and feedback from the focus groups indicated that for a car club scheme to be successful vehicles should also be located outside the low-income neighbourhoods. AESS concluded that a mixed approach should be taken with sites in low income neighbourhoods and at high traffic mobility hubs such as train stations and universities.

ITE and University of Valencia started their site selection process by reviewing users' needs and assessing mobility services for frequent daily journeys. They assessed travel times and costs of private car and public transport (metro and bus) journeys and concluded that public transport increased journey times by around 30 minutes compared to using a private car, even for trips as short as a few kilometres. A shortlist of sites was identified, accounting for parking availability, legal implications, connection with other transport modes and user preferences. However, analysis of potential chargepoint locations found that car club sites would have to be on the neighbourhood borders, next to industrial or commercial areas, in order to install rapid chargers. ITE and University

<sup>&</sup>lt;sup>6</sup> Commercial Business Case Analysis, Social and Environmental Considerations, Procurement and Technical Requirements, and Community Engagement and Marketing Guide are available at https://inclusivev.eu/research-results.



of Valencia identified four suitable locations based on the results of the mobility report plus five more in the neighbourhood borders. Due to the early closedown of InclusivEV these sites were not taken forward for implementation.

#### 3.3 Installation of Infrastructure

Installing and commissioning chargepoint infrastructure is a complex process with multiple uncertainties and risks. In Solihull, SMBC offered to install the infrastructure, with support from project partners and funding from InclusivEV. However, despite its best efforts it was unable to complete this work within the project timescales. As a result, Distribution Network Operator (DNO) quotes for grid connections expired, causing further delays. Ultimately the project partners commissioned a sub-contractor to complete the installations.

#### 3.4 Consultation and Community Engagement

Consulting with residents and other stakeholders is vital to the success of a community-based scheme such as a car club. The UK project partners consulted with Solihull Community Housing (SCH) which owned the land that eight of the proposed sites were on and for which we needed their approval. We held five consultation days to discuss the scheme and the possible sites with residents. The response was positive, with only minor concerns raised around parking.

ITE and University of Valencia started dialogue with the neighbourhood public administration to understand citizens' needs and concerns around mobility. Although this did not feed into deployment of the car club scheme, it did produce some interesting findings; for example, that a demographic group which has a significant unmet need for mobility is women who don't have a driving licence. A potential mobility solution for this demographic is an electric shuttle bus to connect to the nearest subway station.

#### 3.5 <u>Scheme Launch: Solihull</u>

The Solihull scheme launched in November 2018 with a press release and media event in Solihull, leaflets to properties, social media campaign and an advert in the community housing newsletter. E-Car started a targeted telephone prospecting campaign to local businesses. 29 members signed up to the scheme with a further 48 prospective members pending approval. This suggests significant interest from the local community in EV car sharing.

#### 3.6 Vandalism and Scheme Closure

Unfortunately, the Solihull vehicles were subject to repeat and serious incidents of vandalism in the months immediately following scheme launch, as described in the table below.

	Incident 1	Incident 2	Incident 3
Date	26/11/18	24/01/19	09/02/19
Location(s)	Burtons Way Stonebridge Crescent Crabtree Drive	Crabtree Drive	Winchester Drive Crabtree Drive
Number of vehicles affected	Five	Two	Three
Description of damage	Smashed windows Bodywork damage	Number plates broken or removed Bodywork scratched	Smashed windows Bodywork scratched Tyres deflated Vehicles broken into Vehicles moved

Table 2: Description	of Vandalism
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#### InclusivEV

The first incident was reported to the police and a mitigation plan was implemented, which included seeking greater support and relationship building with local officers. We reviewed security features such as alarms and tracking devices, but further vandalism occurred before they could be deployed. All three incidents included damage to vehicles at one location (Crabtree Drive). There are several potential reasons for this, including lack of lighting and CCTV, low levels of footfall, or proximity to the attacker(s)' home or business.

After the third incident E-Car Club removed the damaged cars from their bays and subsequently removed all the remaining cars. The project partners reviewed the costs involved and risk of further vandalism and decided to permanently close down the Solihull scheme.

To our knowledge, such levels of vandalism have not been experienced by other similar schemes. The risks for other schemes should not be overestimated based on what appears to be a location-specific issue. There is no evidence to suggest that the vandalism was an inevitable consequence of the introduction of an EV car club into a low income neighbourhood.

EIT Climate-KIC was unable to approve the completion of the UK demonstration project in Solihull and authorise launch of the Modena project. In addition, in 2019 EIT Climate-KIC re-prioritised its portfolio of activities, meaning InclusivEV no longer met its programme objectives. As a result, funding was withdrawn from InclusivEV in April 2019 and the project closed down.



## 4 Recommendations

InclusivEV has developed the following recommendations from the implementation work in Solihull and the preliminary activities undertaken in Modena and Valencia. These recommendations provide invaluable insights into the complexities of introducing shared EVs in low income neighbourhoods and should be applied by other organisations deploying similar schemes. The recommendations have a wider application than simply EV car sharing in low income areas; many will be applicable to other mobility solutions and demographic groups. Recommendations are broken down by the project phases: technology choice and car club model, site selection, local authority engagement, community and business engagement and infrastructure installation.

#### 4.1 <u>Technology choice and car club model</u>

In Solihull we deployed pure EVs using a back-to-base model, in which cars had to be returned to a specific bay to end the rental period. This offered no flexibility to redeploy vehicles to other nearby sites after the first incident of vandalism. For example, we could have identified sites with higher footfall, better lighting and CCTV coverage, which may have reduced the risk of subsequent attacks. Likewise, with more flexibility, vehicles with poor utilisation levels could have been redeployed to test the conditions required to increase usage.

Schemes should consider approaches which do not rely on fixed infrastructure from the start. This would reduce upfront capital costs prior to launch and allow viability to be tested before investing in infrastructure. Specific recommendations are as follows:

- Deploy EVs in areas where charging infrastructure is already available and can be used by car club vehicles. This will require resource to recharge the vehicles, ideally by recruiting 'community champions' from the local area. This would also help strengthen community buy-in.
- Design a scheme with pure EVs using non-dedicated charging infrastructure or hybrids which could be moved to another site in response to low utilisation.
- Consider a geofenced scheme where cars are located in a defined road or area but not a specific bay. This is still essentially a back-to-base scheme but start and finish locations are typically limited to a single road. It offers more flexibility than a scheme where vehicles must be returned to a specific bay but is markedly different from a free-floating model which allows one-way trips.

#### 4.2 Site selection

Good site selection is crucial to delivering a successful car club scheme. Vehicles need to be in locations where demand will be high enough to make the scheme viable, offer a reasonable level of security and be suitable for installation of chargepoints. The stakeholders involved in site selection (typically a car club provider, a local authority and, in the case of EVs, a chargepoint installer and DNO) will need to reach a compromise over the choice of sites. All sites taken forward for implementation must be considered suitable from the perspective of the car club provider and customers. Specific recommendations are as follows:

- Assess the visibility, footfall, traffic flows and CCTV coverage when reviewing potential sites and consider implementing additional security features. Research undertaken in the UK found that using visible, high traffic areas can help reduce vandalism of assets<sup>7</sup>.
- Consult the local authority, housing associations, community groups, residents' associations and local businesses prior to and during site selection. It may not be possible to consult in depth with all of these groups, but at a minimum they should be provided with information about the proposed scheme.



<sup>&</sup>lt;sup>7</sup> https://www.northants.police.uk/cp/crime-prevention/vandalism/car-protection-damage/

#### 4.3 Local authority engagement

Local authorities have a vital role to play in supporting successful car club schemes, including identifying sites, facilitating community engagement and supporting provision of car club bays and chargepoint infrastructure. When reviewing potential car club locations providers should assess the local authority's capabilities and level of interest. Ideally the authority should have policy objectives around reducing congestion and emissions; car clubs are more likely to secure traction where these topics are policy priorities. In Valencia, the public administration did not engage in InclusivEV because the scheme as proposed didn't meet their policy objectives. This could have been addressed by demonstrating that the scheme would create jobs in the local area. Specific recommendations are as follows:

- Work with an authority that promotes use of shared mobility and EVs and, if required, can commit sufficient resources and political backing.
- Create a RASIC (responsible, approves, supports, is informed, is consulted) document to establish roles and responsibilities for organisations and individuals involved in the project. This should establish relationships between activities and the people involved, set clear responsibilities for each individual and organisation and include a risk register.
- Request a letter of commitment from a senior local authority official based on the RASIC, which can be cascaded to junior teams outlining their roles and responsibilities.
- Discuss timescales and consultation process with the local authority at the start of the project. Ensure that land ownership is determined at the start of the process and seek advice from the planning department if fixed bays and chargers are being added.
- Consider implementing a service level agreement, detailing expected involvement from the local authority, expected investment and potential risks.

#### 4.4 Community and Business Engagement

Community engagement and relationship building to develop a sense of ownership are key to ensuring the success of EV car share schemes in low income neighbourhoods and may help reduce incidents of vandalism<sup>8,9</sup>. Car sharing and EVs may be new concepts for residents, so education and provision of information is important. This process should start as early as possible and continue until the site is live. Specific recommendations are as follows:

- Develop a community engagement plan as soon as a potential location has been identified (before selecting specific sites for bays).
- Engage with community representatives during the site selection process to gather local knowledge about site suitability that otherwise may not be available. A focus group can be a relatively time-efficient way of engaging with community groups.
- Consult the local police for guidance around site selection and protection of assets.
- Identify community user groups prior to the launch to help build anchor demand.
- Start engagement and outreach with the public once you have a confirmed launch date. Tailor communications and marketing materials to the local area and present the scheme as a solution to local problems such as congestion, poor air quality and lack of parking. The Pathfinder report provides more detailed guidance on tailoring community engagement messages and promoting the benefits of car club schemes.
- Establish potential base user groups prior to launch, such as local employers, the local authority and the NHS volunteer drivers' scheme.

#### 4.5 Infrastructure installation

Installing infrastructure for EVs can be a significant challenge for local authorities. Car share schemes which rely on pure EVs and fixed chargepoint locations have a higher risk of issues



<sup>&</sup>lt;sup>8</sup> https://inclusivev.eu/wp-content/uploads/2018/03/IncEV-Executive-Summary.pdf

<sup>&</sup>lt;sup>9</sup> Cenex project team experience of a wide range of schemes across sectors including rail, waste and recycling, and child services.

occurring during this phase. Where chargepoint infrastructure is required, specific recommendations are as follows:

- Create a detailed plan for infrastructure installation, defining roles and responsibilities.
- Appoint a suitable specialist installer to carry out the work. Agree a contract covering tasks required and the deadline for completion.
- If a local authority will be installing the infrastructure, ensure they have experience of completing similar installations to time, cost and quality criteria.
- Consider using vehicle technology and car club models which don't need additional expensive fixed infrastructure.



# 5 Conclusions

InclusivEV was a highly ambitious venture as it attempted to tackle two challenges at once: using pure EVs as car club vehicles and deploying car club schemes in low income areas. As such the project was likely to face challenges around infrastructure installation, achieving sufficient utilisation rates, and securing community buy-in. However, the major challenge encountered, vandalism of the vehicles, was unforeseen and led to the closure of the Solihull demonstrator site and ultimately the wider InclusivEV project.

Despite the early closure of the project, the experiences from the implementation work in Solihull and the preliminary activities undertaken in Modena and Valencia have allowed us to produce a series of recommendations which should be applied by other organisations and consortia deploying shared mobility services in urban areas. We are encouraged by the consistency of recommendations drawn from all three sites, such as the need to reach consensus around siting between private sector mobility scheme operators and the public sector and landowners, and the trade-off between sites which are optimal from a business perspective and those which are best suited to installing supporting infrastructure. Future projects should consider these issues carefully and in depth as early as possible.

There are several valuable legacy assets in Solihull, including car club bays and chargepoint hardware and significant interest in EV car sharing among the local community. InclusivEV project partners are considering how to move forward with these assets and overcome the issues encountered. In Modena, stakeholders are exploring options for implementing an EV car club and are working closely with potential car club providers. In Valencia the scheme is on hold while officers seek additional funding, as the delays and closure of InclusivEV led to a lack of commitment within the community.

The scope of InclusivEV in the UK was specifically focused on EV car sharing. Other projects should start with a broader scope by reviewing the mobility needs of the neighbourhood and then defining and implementing the most appropriate solution. For example, early work in Valencia found that an electric shuttle bus was more appropriate than a car club for some users. Solutions should be matched to specific local challenges and not pre-determined.

InclusivEV recommends that organisations and consortia interested in deploying mobility services in urban areas contact Cenex<sup>10</sup> to discuss how it can help planning, implementing and evaluating successful schemes. Local authorities or businesses interested in how car sharing schemes can help cut costs and emissions should contact a supplier such as E-Car Club<sup>11</sup> to discuss their services. Finally, the InclusivEV partners wish to thank EIT Climate-KIC<sup>12</sup> for their financial and non-financial support through the lifecycle of this project.



<sup>&</sup>lt;sup>10</sup> <u>http://cenex.co.uk</u>

<sup>&</sup>lt;sup>11</sup> <u>http://ecarclub.co.uk</u>

<sup>&</sup>lt;sup>12</sup> <u>https://www.climate-kic.org/</u>



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