Electric Vehicle Strategy for the Liverpool City Region 2014-2024

Ensure e-mobility is widely recognised as a viable transport option within Liverpool City Region
Executive Summary

The Liverpool City Region has come together to develop a strategy to speed the uptake of electric vehicles across Merseyside. This document includes an overview of activity relating to electric vehicles from across the UK and provides recommendations for deliverable projects, which can be delivered independently or as a joint package of activities, by the City Region working together or each local authority separately. The projects target the areas where a transfer to electric vehicles has the biggest impact, due to journey types, frequencies and visibility. The deployment of electric vehicles across the region works in parallel to the planned roll out of recharging infrastructure, as well as incorporating planned and existing transport initiatives such as car and bike clubs.
Contents

Executive Summary .............................................................................................................. 1

1) Scope and context ............................................................................................................. 0

1.1 E-mobility ....................................................................................................................... 0

1.2 Geographical scope and definitions ............................................................................... 0

1.3 Wider Geographical Context ......................................................................................... 1

1.3.1 Key User Groups ......................................................................................................... 2

1.3.2 Environmental Impact of Electric vehicles .................................................................. 3

2) Liverpool City Region e-mobility objectives .................................................................. 5

2.1.1 A - Initiate, support and promote e-mobility within Liverpool City Region ............... 6

2.1.2 B – Focus on accelerating receptive and viable e-mobility opportunities .................... 6

2.1.3 C - Scope projects to raise the profile of e-mobility ................................................ 6

2.1.4 D - Install a visible and viable public infrastructure .............................................. 6

2.1.5 E – Maintain development with local control ....................................................... 6

3) Liverpool City Region e-mobility initiatives ................................................................. 7

3.1 Initiative One - EV Fleet Trial ......................................................................................... 10

3.1.1 Overview ................................................................................................................... 10

3.1.2 Liverpool City Region EV-Fleet offering .................................................................. 10

3.1.3 Target audience ........................................................................................................ 11

3.1.4 Benefits for Liverpool City Region ............................................................................ 11

3.1.5 Benefits for other stakeholders ................................................................................ 12

3.1.6 Components of delivery .......................................................................................... 12

Charging Requirements ...................................................................................................... 13

Key challenges .................................................................................................................. 13

3.1.7 Costs .......................................................................................................................... 13

3.1.8 Key stakeholders ....................................................................................................... 16

3.1.9 Funding ...................................................................................................................... 16

3.2 Initiative Two - Developer focus .................................................................................. 17

3.2.1 Overview ................................................................................................................... 17

3.2.2 Components of delivery .......................................................................................... 17

3.2.3 Key Stakeholders ...................................................................................................... 19

3.3 Initiative Three - E-Car Club and E-mobility hubs ......................................................... 20

3.3.1 Overview ................................................................................................................... 20

3.3.2 Liverpool City Region e-car club offering ............................................................... 20
3.3.3 Target audience .................................................................................................................. 20
3.3.4 Benefits for Liverpool City Region ..................................................................................... 20
3.3.5 Benefits for other stakeholders ........................................................................................ 21
3.3.6 Components of delivery .................................................................................................. 21
3.3.7 Costs .................................................................................................................................. 22
3.3.8 Managed Pool Cars ........................................................................................................... 23
3.3.9 Components of Delivery .................................................................................................. 24
3.3.10 Risks and Costs .............................................................................................................. 24
3.3.11 Cycle and E-Cycle Hire .................................................................................................. 24
3.3.12 Components of Delivery .................................................................................................. 25
3.3.13 Risks and Costs .............................................................................................................. 25
3.3.14 Integrated Ticketing ........................................................................................................ 25
3.3.15 Key stakeholders ............................................................................................................. 27

3.4 Initiative Four - Liverpool City Region e-taxis .................................................................. 28
3.4.1 Overview .......................................................................................................................... 28
3.4.2 Offering ............................................................................................................................ 28
3.4.3 Target audience ................................................................................................................ 28
3.4.4 Benefits for Liverpool City Region ..................................................................................... 28
3.4.5 Benefits for other stakeholders ........................................................................................ 28
3.4.6 Components of delivery .................................................................................................. 29
3.5.7 Challenges ........................................................................................................................ 29
3.5.8 Key stakeholders ............................................................................................................. 30

3.5 Initiative Five - Liverpool City Region E-visitor (E-Tourism) .................................................. 31
3.5.1 Overview .......................................................................................................................... 31
3.5.2 Liverpool City Region e-visitor offering ........................................................................... 31
3.5.3 Target audience ................................................................................................................ 31
3.5.4 Benefits for Liverpool City Region ..................................................................................... 32
3.5.5 Benefits for other stakeholders ........................................................................................ 32
3.5.6 Components of delivery .................................................................................................. 32
3.5.7 Key stakeholders ............................................................................................................. 34

3.6 Initiative Six - Marketing and Communications .................................................................... 35
3.6.1 Overview .......................................................................................................................... 35
3.6.2 Benefits to Liverpool City Region ..................................................................................... 35
3.6.3 Components of Delivery .................................................................................................. 36
3.6.4 Costs .............................................................................................................................. 37
3.6.5 Stakeholders .................................................................................................................... 37
3.7 Initiative Seven - Charging Point Location Decision Making ........................................... 38
3.7.3 Overview ...................................................................................................................... 38
4 Partners and Stakeholders .................................................................................................. 40
5 Delivery and Time Scales .................................................................................................. 41
6 E-Mobility Implementation Plan .......................................................................................... 42
Appendix 1: Car Club Models ............................................................................................... 45
Appendix 2 - Glossary of Terms ............................................................................................ 47
Appendix 3 – Case Study for Switch EV ............................................................................... 56
Appendix 4 – EV Trial Vehicle Deployment Plan .................................................................. 58
Appendix 5 – Managed Pool Car and E-Bike ...................................................................... 61
Appendix 6 – Technical Specifications for EV Ready Homes .................................................. 66

Figure 1 - Key national EV infrastructure projects .................................................................. 2

Table 1 - EV infrastructure projects in relevant local area ....................................................... 2
Table 2 - Proposed Initiatives and the Goals they deliver .......................................................... 8
Table 3 – Risk Assessment of Initiatives ............................................................................... 8
Table 4 - Indicative Risk Assessment ....................................................................................... 22
Table 5 - Example Matrix Decision Chart for Charging Point Location ............................... 39
1) Scope and context

1.1 E-mobility
This strategy focuses on increasing e-mobility within Liverpool City Region.

E-mobility is defined as the use of plug-in vehicles including cars, vans, scooters and bicycles and provision of the necessary services and facilities to support their uptake and use. Plug-in technologies include pure battery electric vehicles (BEVs), plug in hybrid electric vehicles (PHEVs) and extended range electric vehicles (EREVs), Within this document all are included in the term EV.

Because of their range and charging requirements, EVs do not necessarily provide a direct replacement for normal internal combustion engine vehicles (ICE), therefore e-mobility tends to include alternative approaches to vehicle ownership and use. These approaches are also typically consistent with reducing environmental impact and often include various versions of the car club model.

1.2 Geographical scope and definitions

The Merseyside Transport Partnership includes the Integrated Transport Authority (ITA) and the local authorities Knowsley, Liverpool, Sefton, St Helens and Wirral, and is responsible for the Local Transport Plan (LTP3). Merseytravel is the operating name for the Merseyside Integrated Transport Authority and Merseyside Passenger Transport Executive (PTE). Halton has developed its own Local Transport Plan, which closely aligns with Merseyside’s to form a Liverpool City Region (LCR) approach. More information about the roles and responsibilities, including governance and corporate structure, will be discussed in section 4, Key Stakeholders.

This document relates to the Liverpool City Region which includes the local authority areas of Halton, Knowsley, Liverpool, Sefton, St Helens and Wirral.

The City Region has been chosen to provide the geographical scope because of the technology and infrastructure implications of E-mobility, these have a better strategic fit with the City Region than with the current Merseyside Transport Partnership area alone.

In the context of current funding availability, it should be noted that for the Local Transport Plan (LTP3) Merseytravel has responsibility for delivering relates to a different area from the City Region. The Merseyside LTP3 covers Knowsley, Liverpool, Sefton, St Helens and Wirral whereas Halton has its own LTP, which has been developed in line with the Merseyside plan.

Similarly the Local Sustainable Transport Fund (LSTF) funding managed by Merseytravel also excludes Halton in its geographical scope.

1 A list of various car club models can be found in Appendix 1
1.3 Wider Geographical Context
To be successful EV infrastructure must be developed to enable electric vehicle drivers to charge wherever required. This means that schemes, for example those outlined below on a national level (and in particular adjoining schemes) need to be designed to co-operate. Co-operation will help facilitate the interoperable use of multiple infrastructure schemes using a single mechanism whether it be a card or pay-as-you-go subscription. In this context it is important to understand what relevant projects are being developed around Liverpool City Region.

A bid was developed and co-ordinated by Merseytravel in 2009 for the second phase of Plugged in Places (PiP) funding, to develop an integrated regional recharging infrastructure on behalf of the Liverpool City Region. The bid was unsuccessful in gaining financial support from the Office of Low Emission vehicles (OLEV) but brought together regional capability and stakeholders on this issue and established a firm commitment from the region to develop a joint approach to electric infrastructure provision.

The successful PiP regions were the North East, Milton Keynes, London, the East of England, Greater Manchester, the Midlands, Scotland and Northern Ireland.

As UK infrastructure development starts to expand outside of the successful PiP regions, specific infrastructure projects are now being initiated in the Leeds City Region, York, South Yorkshire and Hull as well as across Liverpool.

Table 1 - EV infrastructure projects in relevant local area

<table>
<thead>
<tr>
<th>Location</th>
<th>Work Scope Overview</th>
<th>Start Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leeds City Region</td>
<td>• Strategy development</td>
<td>Q1 2013</td>
</tr>
<tr>
<td></td>
<td>• Approach made to engage stakeholders</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Initial back office provision investigation</td>
<td></td>
</tr>
<tr>
<td>Hull</td>
<td>• Council installing required charging points</td>
<td>Q4 2012</td>
</tr>
<tr>
<td>York</td>
<td>• Charging posts and back office provider – Charge Your Car system</td>
<td>Q4 2012</td>
</tr>
<tr>
<td>Sheffield City Region</td>
<td>• Funding allocated in LSTF for installing a recharging infrastructure</td>
<td>Q1 2013</td>
</tr>
<tr>
<td></td>
<td>• EV and infrastructure trial planned and due to commence Q3 2013</td>
<td></td>
</tr>
<tr>
<td>Liverpool City Region</td>
<td>• OLEV funding received – Public Estate and Rail Stations</td>
<td>Q3 2013</td>
</tr>
<tr>
<td></td>
<td>• Strategy development document planned</td>
<td>Q4 2013</td>
</tr>
<tr>
<td>Manchester</td>
<td>• PIP funding awarded – Charge Your Car system</td>
<td>Q2 2010</td>
</tr>
</tbody>
</table>

Announcements for further financial support for the recharging points came from the Office of Low Emission Vehicles, OLEV, on 19th February 2013, which will result in recharging systems developing across more of the UK.

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2 A glossary of terms, including frequently used abbreviations can be found in the Appendix 2
As shown in Table 1, Merseytravel and its partners have been successful in applying for funding for recharging posts on public sector estate, at train stations and for rapid chargers. A grant of £206,250 has been awarded for the year 2013/14 with a further £153,750 for 2014/15 to develop charging infrastructure on public sector estate. The Merseytravel Project has also been awarded £75,000 for the year 2013/14 with £30,000 for 2014/15 for charging infrastructure in train station car parks with a total project value of £620,000. The application process has engaged with a number of partners to agree on joint procurement policies for both the hardware and the back office system, and will be bringing together existing transport policies and commitments in the LTP.

1.3.1 Key User Groups
Considering the findings of national and international research into EV uptake as well as, taking into account Liverpool City Region objectives, the views of local authority officers from transport and planning, air quality and development, and stakeholders involved in previous PiP and OLEV bids representing Merseytravel, the Chambers of Commerce and business partners, the following potential EV user groups have been identified as the priority areas of focus.

- Organisations incorporating EVs within their fleets (purchased or leased) and promoting them to employees (potentially through salary sacrifice schemes).
- Inter and intra-urban light commercial freight transport.
- Visitors to the region, including short stay business visitors as well as tourists and other leisure related visitors.

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3 Please refer to the LTP3 Document and Liverpool City Region core objectives, [http://www.liverpoollep.org/about_lep.aspx](http://www.liverpoollep.org/about_lep.aspx)
• Organisations receptive to alternative mobility solutions such as car clubs (not necessarily e-mobility focussed but with the potential to include EVs).
• Potential personal EV purchasers, based on demographic analysis, new car purchasers, second car owners, commuters (etc.)
• Multi-modal travellers who require a range of transport options

The priority groups described represent opportunities to increase the profile of EVs, influence stakeholders who may be more likely to use/purchase/lease EVs and create new mobility models suited to EVs to enable sustainable transport and travel across the LCR and beyond.

1.3.2 Environmental Impact of Electric vehicles

The environmental case for electric vehicles differs depending on the fuel used to produce the electricity it uses, car production and the usage of the vehicle and the battery life.

In regions where fossil fuels are not the main sources of electricity, are driven over 150,000km and a long battery life; electric vehicles have a lesser environmental impact than conventional diesel or petrol vehicles.¹

During operation the environmental case for electric vehicles is:

1. **Reduced greenhouse gas emissions**

   To achieve the Government’s target to reduce greenhouse gas emissions by 80% by 2050 road transport needs to decarbonise by 95% and with an expected increase in passenger vehicles by 2050; zero or low carbon electric vehicles can offer the potential to meet the increasing need and decarbonise the sector.

   The chart below, from The Carbon Plan: Delivering our low carbon future 2011 ⁵, shows the projected average new car and van emissions of both internal combustion engine and ultra-low emission vehicles to 2050.

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Decarbonising the transport sector will not only reduce the UK’s carbon emissions but it will also reduce security risks associated with use of fossil fuels and help to ease demand for oil.

2. **Improved air quality**

   Road transport is a significant contributor to poor air quality and is the main source of air pollution in 92% of areas identified by local authorities as having problematic pollution levels. Many urban areas have Air Quality Management Areas (AQMAs) for nitrogen dioxide emissions (NO₂) and particulates. Battery electric vehicles produce no pollutant emissions at the tailpipe, and most use regenerative braking technology, which has the benefit of reducing particle emissions from brake wear. A significant uptake of zero-emission vehicles will help move the UK towards compliance with its air quality legal obligations and help reduce the impact of poor air quality on health, particularly in the worst affected urban centres.

3. **Reduced noise**

   The reduced noise from electric vehicles will benefit the natural environment and residents.

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2) Liverpool City Region e-mobility objectives

Transport is an area identified by the LCR LEP as a key growth area within the Low Carbon economy, alongside energy, networks and buildings. The transport sector is a huge consumer of energy and producer of CO2 emissions and air pollution. In 2005 the Liverpool City Regions transport sector consumed 23% of the total energy consumed and emitted 24% of CO2. These figures highlight the pressing need to progress provision of a more sustainable transport system with a focus on E-mobility and potential linkages with other alternative fuels that can be used for transport such as hydrogen or biofuels.

There are obviously a number of opportunities for transport and in particular E-mobility and the LCR Low Carbon Economy Action Plan specifies key opportunities where transport will be crucial to driving forward growth and investment in the City Region’s Low Carbon economy whilst developing a low emission, sustainable transport system. These opportunities include:

- Development of a Smart Grid which encompasses electric vehicle infrastructure
- Low Emissions Vehicles, covering both electric and the use of alternative fuels such as hydrogen and Energy from Waste (EfW)
- Low Carbon Port Access and Intelligent Logistics
- Development of Hydrogen infrastructure

The LCR is located in the centre of a region with significant world class vehicle manufacture and assembly expertise alongside supply chain centres of excellence and a strong academic base both covering electric and other alternative fuels. This combination creates a unique environment for development, trial and implementation of these technologies. It is important that these opportunities are maximised to ensure the LCR is at the forefront of the Low Carbon transport sector and that this sector contributes to and drives forward economic growth across the City Region.

Also, within Merseyside’s LTP3 with its 2024 horizon has the objective of having a Clean, low emission transport system – resilient to climate change and oil availability. (Goal 2 of 6 in the LTP). Within this is a commitment to develop an approach to alternative fuels which this strategy supports through its focus on electric re-fuelling.

The following is a proposed new sub-objective to this commitment relating specifically to e-mobility of which this strategy provides the approach that can be carried forward into any future regional transport strategy.

**Ensure e-mobility is widely recognised as a viable transport option within Liverpool City Region**

This document outlines 5 goals that will help this objective to be achieved.

A. Initiate, support and promote e-mobility within Liverpool City Region.
B. Focus on accelerating receptive and viable e-mobility opportunities
C. Ensure projects actively raise the profile of e-mobility

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The Liverpool City Region will focus on increasing e-mobility through creating opportunities for electric vehicles and charging infrastructure to be deployed in parallel and not individually. Evidence suggests that the key deciding factor in relation to whether EVs are adopted is whether they are fit for purpose in financial and operational terms. Simply deploying charging infrastructure wherever possible does not, in itself increase EV use. Similarly Operating EVs with no infrastructure is challenging.9

2.1.2  B – Focus on accelerating receptive and viable e-mobility opportunities
The Liverpool City Region, and the partner organisations within the Merseyside Transport Advisory Group, will support individuals, organisations and initiatives actively aiming to increase the viable use of e-mobility. This means that first, the project delivery Partnership (envisaged that this will be made up of representatives from Local Authorities) will aim to act as an enabler for those actively seeking to increase e-mobility and second, the delivery partners will give priority to initiatives that can demonstrate a sound link between charging infrastructure and electric vehicles. Particular emphasis will be on supporting the development of charging infrastructure where there is an immediate electric vehicle led opportunity.

2.1.3  C - Scope projects to raise the profile of e-mobility
The project delivery Partnership will prioritise support for projects that raise the profile of e-mobility and actively assist individuals and organisations to use electric vehicles.

2.1.4  D - Install a visible and viable public infrastructure
The project team will work with the public and private sectors to develop a preliminary public charging infrastructure. Charge point locations that offer justifiable utility and/or high value educational/awareness raising value will be prioritised, as well as those which support specific e-mobility objectives.

2.1.5  E – Maintain development with local control
The Liverpool City Region will contribute to the development of e-mobility in the context of it representing a high value, differentiating opportunity for the region. With this in mind the LCR will look to develop mandatory conditions and recommended guidelines to maximise the extent to which regional activity is joined up and compatible with neighbouring systems and future technologies. LCR will also maintain an active operational involvement in e-mobility systems to ensure they are kept current and represent broader technology, research and development and business opportunities for the region.

The five goals listed above are consistent with the priorities of the Liverpool City Region – Strategic Economic Plan, LTP3, local authority strategies such as contributing to reductions in harmful emissions and the Local Sustainable Transport Funding scheme.

9 Feedback from TSB project – Switch EV – case study included in Appendix 3
3) Liverpool City Region e-mobility initiatives

The following section outlines a set of phased strategic initiatives that represent practical steps towards the Liverpool City Region delivering against the 5 goals presented in Section 2.

The initiatives derive from suggestions presented by local authorities and other regional stakeholders as well as calling upon experience gained within other e-mobility projects operational in the UK and overseas.

The initiatives are phased to enable revenue and capital to be built up using a range of funding opportunities and teams of resource.

The initiatives also capitalise on activity already being considered or planned from stakeholders across the region so that these can be accelerated cohesively to create knowledge and awareness.

To ensure targeted and successful uptake of electric vehicles, individual sub-projects will be developed, independently of each other. Each discreet project will target a particular audience, and contribute to the overall goals if this regional strategy. The projects can be developed over differing time scales to capitalise on funding opportunities and those that can be implemented in the shorter term will be prioritised.

The eight initiatives with the most potential to deliver positive change are:

1. **EV Fleet trial** – create an approach for organisations and individuals to easily trial EVs over a productive time frame and at relatively low risk.

2. **Developer focus** – ensure development control is fully capitalised upon in establishing charging infrastructure within new domestic, commercial and public developments.

3. **E-Car Club and ‘e-mobility hub’ development** – develop partnership approaches to maximising the opportunities for car clubs and the use of EVs made available by the EV trial within car clubs. The development of e-mobility hubs should also include provision for electric scooters and mopeds, potentially including e-bike hire schemes.

4. **E-Taxi scheme** – develop electric taxi ranks where practical and facilitate the provision and installation of charging infrastructure and licensing provision that supports uptake.

5. **E-Tourism** – integrate e-mobility schemes with other forms of transport to offer tourists a joined up low emission transport experience. Incorporate ancillary benefits to increase the attractiveness to target user groups.

6. **Dedicated Marketing and Communications Package** – developing a one-stop shop bringing together all of the actions and wider information for all transport users about e-mobility options. This could be developed to incorporate the operational functions such as integrated ticket sales and memberships potentially through the Smarter Choices and individual Partner websites.

7. **Charging Point installation guidance** – to ensure charging points are installed in the most beneficial locations and assessed under the same criteria.

8. **E-Freight and logistics** – Undertake feasibility work to ensure low emission fleet operation is core to the LCR approach to freight. There is significant long term potential
in promoting electric vehicles for use within light commercial vehicle fleet operation, including the installation of rapid charging suited to facilitating inter and intra urban fleet operation. Significant regional logistics demonstrate future opportunities to introduce lower carbon transport options. However, there needs to be a better supply chain for the freight vehicles, and considerable research and feasibility work needs to be completed before action can be taken.

Table 2 – Proposed initiatives and the Goals they deliver

<table>
<thead>
<tr>
<th>INITIATIVE</th>
<th>GOAL</th>
<th>A. Initiate, support and promote e-mobility within Liverpool City Region</th>
<th>B. Focus on accelerating receptive and viable e-mobility opportunities</th>
<th>C. Ensure projects actively raise the profile of e-mobility</th>
<th>D. Install a preliminary visible and viable public infrastructure</th>
<th>E. Maintain development with local control</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. EV Fleet trial</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>2. Developer focus</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. E-Car Club and e-mobility hub development</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>4. E-Taxi scheme</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. E-Tourism</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>6. Marketing and Comms</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Charing point installation Guide</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. E-Freight and logistics</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Table 2 - Mapping how initiatives link to the 5 Goals of the strategy

Each initiative is discussed in more detail in the following section, especially where there is more resource required from the Liverpool City Region. A basic risk assessment approach to each of the initiatives is below.
Table 3 – Risk assessment of initiatives

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Risk to LCR</th>
<th>Cost to LCR</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. EV Fleet Vehicle Trials</td>
<td>Low – interest secured from trial candidates prior to launch of project.</td>
<td>Medium – financial support required to make vehicles available at an attractive cost.</td>
</tr>
<tr>
<td>2. Developer Focus</td>
<td>Low – costs and delivery pass to the developer</td>
<td>Low</td>
</tr>
<tr>
<td>3. E-Car Club and Integrated E-Mobility</td>
<td>Low – work passed to contracted car club provider</td>
<td>None – officer time only</td>
</tr>
<tr>
<td>4. E-Taxi</td>
<td>Medium – high visibility project, also requiring on-street infrastructure</td>
<td>Medium – financial support may be required to encourage taxi companies to join. Rapid charger provision required.</td>
</tr>
<tr>
<td>5. E-Visitor Initiative</td>
<td>Low – marketing campaign with tourism locations</td>
<td>Low – costs passed or shared with external organisations</td>
</tr>
<tr>
<td>6. Marketing and Communications</td>
<td>Low – an extension to existing communication plans</td>
<td>Medium – some outlay for new materials, events, promotions and staff time</td>
</tr>
<tr>
<td>7. Charge point location matrix</td>
<td>Low – it ensures the best locations are secured</td>
<td>None – one step within the existing evaluation process</td>
</tr>
</tbody>
</table>
### 3.1 Initiative One - EV Fleet Trial

#### 3.1.1 Overview

Providing organisations and individuals across the Liverpool City Region with a low risk, low cost, convenient opportunity to trial electric vehicles, with part funded recharging infrastructure in support, where funding is available and eligible.

Trials to date have demonstrated that participants are attracted to trials because they provide a ‘turnkey opportunity’ without them having to undertake all the research into vehicles, infrastructure, leasing contracts etc. themselves.

#### Case Study

The North East SWITCH EV trial attracted much media attention so raised the profile of EVs within the region and also resulted in 25% of Leaf driving participants subsequently purchasing/leasing a vehicle themselves. The 48 trial participants given access to the Leaf included individuals who have since purchased electric vehicles and organisations where there are now multiple electric vehicles included on their fleet.

Vehicle manufacturers are keen to increase EV sales and are receptive to participating in projects that would lead to increasing awareness and sales of EVs. Several projects have now been set up to include non-standard and preferential leasing terms to facilitate the delivery of vehicle trials.

#### 3.1.2 Liverpool City Region EV-Fleet offering

- The aim is to support up to 50 electric vehicles from various manufacturers being taken-up for 6-24 month contract hire to individuals and organisations across the Liverpool City Region.
- The project will be based on the formation of partnerships with manufacturers, contract hire companies and infrastructure providers by members of the delivery partnership.
- Local Authorities within the LCR will undertake a low cost EV fleet review. The project will be set up to enable vehicles to be deployed within the e-visitor and e-car club projects as well as organisations for pool car, operational fleet or individual’s use. E-bikes and scooters and other two wheel transport solutions will also be considered.
- Critically the project will be structured to facilitate preferential relationships between users and vehicle and infrastructure providers rather than enter directly into contracts between the two. On this basis fleet managers will contract directly with vehicle and infrastructure suppliers.
- For Local Authority employees a salary sacrifice scheme could be set up by their employer to enable the cost of purchasing a new EV to become more affordable.
- The aim is that vehicles and infrastructure will be made available within an attractive ‘package’ including the contract hire agreement.
- Charge points will be co-funded by OLEV where feasible or potentially match funded by the vehicle supplier or other contributory sources.
3.1.3 Target audience

Priority groups to be approached for inclusion in the trial will be:

- Private and public sector fleets including grey fleets.
- Organisation providing services to the public sector or organisations providing services to companies with high environmental standards.
- Larger company employees
- SMEs (if European Regional Development Fund (ERDF) funding is employed in project delivery)
- Individuals including commuters travelling into major employment hubs.
- Companies providing services to visitors to Liverpool City Region
- Car club operators

Specific targets to recruit trial participants include:

1. Merseytravel’s employers network of 100+ businesses
2. Additional network groups, such as Mersey Maritime, Liverpool Vision, LEP, Chambers of Commerce etc.
3. Major employment sites such as Knowsley Industrial Park and Daresbury Science Park
4. Employers identified as partners in the Plugged in Places / OLEV bids.
5. Additional major regional employers such as Virgin, Unilever, Cammell Laird, Peel Group, Novartis, Prinovis, NSG Pilkington, Stobart Group, Shop Direct Group, Santander, Maersk etc. who have already been approached with regards travel planning or electric vehicles.
6. Residents in commuting zones into city centres, ensuring trips of no more than 60 miles.
7. City Centre companies and companies where parking is at a premium, and so the adoption of pool cars is most attractive.

If Local Sustainable Transport Fund (LSTF) funding or indeed any other funding source is used then some additional conditions may apply.10

3.1.4 Benefits for Liverpool City Region

- Provide mutually beneficial contact between individuals and organisations and electric vehicles manufacturers’ thereby supporting increased uptake
- Increasing awareness and knowledge of electric vehicles and charging points for companies based within the city centre.
- Increase the longer term use of EVs within the region as trial participants move on to buy or lease vehicles beyond the trial period.
- Provide a mechanism to initiate the provision and operation of charging infrastructure within the region. Links between vehicles and infrastructure will ensure the infrastructure is used. Installing charge points in demand led locations increases the likelihood of long term use and viability.
- Increases the combination of EV awareness and infrastructure provision with the ultimate benefit of increasing EV acceptance and sales.

10 For example, Liverpool City Council has funding suitable for the installation of charging points for companies based within the city centre.
• Contribute to the reduction of vehicle emissions and transport noise, and the improvement of air quality within Liverpool City Region.
• Increase the commitment of EV manufacturers and dealerships to supporting EV sales within the region.
• Economic benefits of increased demand on manufacturing and jobs in the region related to low emission vehicles, infrastructure and services

3.1.5 Benefits for other stakeholders
• Trial participants will benefit from a relatively low hassle, lower cost, low risk opportunity to experience EVs.
• Trial participants will experience the use of EVs within their normal course of life.
• Organisations will determine whether EVs offer a viable solution to their operational requirements.
• Opportunity to build an evidence base to support further EV work, following the trial

3.1.6 Components of delivery

A. Market research
   a. Use regional membership organisations to test market the concept with a wide range of local businesses
   b. Use local press to solicit interest from the general public.

B. Partnership development
   a. Establish OEM interest
      i. Meet with electric vehicle providers to discuss project and establish in principle participation agreements. Nissan, Renault and Peugeot offer the most potential
      ii. Provide outline project description and requirements
   b. Establish Infrastructure interest
      i. Meet with potential charge point supply and installation partners to establish interest
      ii. Provide scope and request proposals
   c. Develop partnerships
      i. Establish partnership agreements with vehicle and infrastructure partners

C. Customer offering
   a. Develop detailed customer offering

D. Contractual structure
   a. Develop contracts to cover vehicle leasing, insurance, charge point supply and operation

E. Project promotion
   a. Develop project website, promotional partners and plan

The Partners will establish attractive arrangements with vehicle manufacturers and leasing companies whereby vehicles can be leased to organisations for 6-12 months at an acceptable commercial rate. This will be facilitated by the Project Partnership

---

11 See appendix 4 with example vehicle deployment plan
Charging Requirements
- On street charging posts next to employers buildings
- Employer installs (off street but accessible)
- Domestic for individual employees
- Links with a wider regional network

Key challenges
- The first challenge for the LCR is to agree the potential for a central project team to manage and deliver a co-ordinated trial approach including leasing arrangements (through some form of ‘framework’ arrangement’).
- Establishing an agreed subleasing contractual structure for all Partners
- Recruitment of interested organisations to the project
- Ensuring recharging system in place
- Funding for Fleet trial

Risk Mitigation
- Research prior to project set up establishing the level of demand from organisations to join a regional trial or time to support organisations to make their own informed arrangements.
- Initial consultations, including links to on-line questionnaires distributed to over 40 organisations, detailed conversations with Chambers of Commerce representatives, officers with the local authorities, electric vehicle providers and feedback from existing electric vehicle trials across the country, shows that:
  - Responses to initial surveys show that 20+ organisations would be keen to take part in a trial.
  - Costs for the vehicles should be no more than equivalent petrol vehicles.
  - Lease periods should be at least 2 months, and up to 6 months.
  - Passenger vehicles are most in demand.
  - Some interest in small commercial vehicles and 2 wheeled vehicles.
- Commitment from organisations can be secured before entering into any contractual arrangements.
- Partnership with vehicle providers can remove any financial requirements with regards to the vehicle leasing costs.
  - Nissan, Renault, GM and Peugeot have all expressed an interest in providing vehicles and access to finance companies to offer preferential lease rates
- Appointing an external project manager to ensure all elements are set up and delivered as efficiently as possible.

3.1.7 Costs
Setting up the project will require time, either from a central project team from within one of the Partners, or from an external project management team. The scale will be dependant on whether a trial is centrally co-ordinated or just a framework developed for all Partners to use.
• With known organisations confirmed in advance of fully developing the project, risks are significantly lowered.
• Monthly lease cost can be set to recoup some project management costs, although the vehicles should still be available at attractive rates to the end user.

Charging infrastructure can be procured and installed to exactly match demand from the relevant company. For any public sector organisation, or where charging points can be installed on street and made publically available, OLEV funding will contribute to the cost. Currently within certain areas covered by the Local Sustainable Transport Fund (LSTF) in Liverpool, up to £10,000 per company is available for capital expenditure on infrastructure such as charging posts. Future funding opportunities will be targeted to provide infrastructure as required.
Case Study – Electric Vehicle Trial

Project details

Project category: Demonstration
Vehicle category: PC
Timeline: 1st June 2009 to 31st May 2013
Funding: Grant offered £5.4m total expenditure £10.7m.

Partnership:
- Nissan – Lead Partner
- Newcastle University
- AVID Vehicles Ltd
- Liberty Europe Electric Cars Ltd
- Simon Bailes Ltd
- Smith Electric Vehicles Europe Ltd

Project description

The North East’s EVADINE electric vehicle trial is one of eight national trials of electric & hybrid vehicles funded by the Technology Strategy Board’s £25m Ultra Low Carbon Vehicle Demonstrator Programme. EVADINE delivered 44 new and innovative electric vehicles onto the roads of the North East. The trial started in November 2010 and extended until May 2013. In that time members of the general public were invited to use the vehicles for 6 months as they would their conventional petrol or diesel powered cars.

The trial was unique nationally in that it was operating in conjunction with the ‘Plugged in Places’ infrastructure project allowing the vehicles to operate in an environment with capable public charging.

Project Objectives

Vehicles Delivered
- 15 off Nissan Leafs
- 1 off SEV Edison
- 2 off Liberty Range Rovers
- 20 off Peugeot iOn
- 6 off AVID CUE-V

The trial scope included 8 specified deliverables, including:
- Successful delivery to the trial of 44 EVs
- Over 150 trial periods with “real world” drivers
- Data collection from the trial vehicles and subjective data from the drivers
- Awareness raising of EVs in the North East of England

- Increased understanding of electric vehicle recharging, with domestic, commercial and street based charging points, associated with the Plugged in Places project
- Knowledge transfer within the Consortium and the wider business community
- Creation of at least 7 jobs

Project achievements and Impacts

Business Opportunities Realised

EVADINE supported the partners in their development of EV platform technology. It has helped to prime the electric vehicle market in the UK and has supported investment decisions such as Nissan’s plan to build the new Leaf at Sunderland.

Market Penetration (quantified)

EVADINE led to the direct sales of over 20 EVs to trial drivers during the course of the trial, with many more enquires in process.

Long term social and Economic sustainability

All project partners are now employing more people within the specific technology areas involved. Multiple training and education courses specifically for EVs are now in place.

Positive Environmental Impacts (quantified)

Extensive research from TCRG calculated the average emissions from EVs at 85g/km (UK car average 208 g/km). Additional research has shown a distinct shift towards overnight recharging, when grid emissions are lower, when informing and providing incentives for drivers. Significant improvements in air quality have been seen, especially within urban areas.
### 3.1.8 Key stakeholders

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liverpool City Region Partners Eg Authorities, Merseytravel, LEP, Chamber</td>
<td>Define, promote, deliver, Trial participants, provide infrastructure</td>
</tr>
<tr>
<td>Private / Commercial Companies</td>
<td>Justification, Define, promote, deliver, Trial participants, provide infrastructure</td>
</tr>
<tr>
<td>Vehicle manufacturers</td>
<td>Provide support in developing the LCR market area and provide attractive prices that can be used to attract customers.</td>
</tr>
<tr>
<td>Vehicle distributors</td>
<td>Provide high quality vehicle hand over and support service.</td>
</tr>
<tr>
<td>Vehicle finance companies</td>
<td>Provide flexible contracts to facilitate the trail</td>
</tr>
<tr>
<td>Infrastructure providers</td>
<td>Provide part-funded service in support of the trail vehicles.</td>
</tr>
<tr>
<td>Lease Hire Companies</td>
<td>Provision of vehicles</td>
</tr>
</tbody>
</table>

### 3.1.9 Funding

Government support is currently in place to develop the industry, with funding being made available from OLEV to support innovation, interoperability and increased development of the infrastructure. The Plug-in Car Grant is available, providing up to £5,000 (to a maximum of 20% of the vehicle’s value) for numerous electric and plug in vehicles, as well as the Plug-in Van Grant, offering up to £8,000 off the cost of a qualifying plug in van. There is currently no road fund licence, no congestion charge, and 100% write down allowance for company purchases. In some PiP areas, parking and recharging is free of charge. OLEV funding will contribute to domestic and supporting public charge points.

Other public sector funding streams that have been used to deliver EV related projects include LSTF, ERDF, Technology Strategy Board and Air Quality Grants and new sources will continue to be examined to support implementation of the strategy e.g. LSTF to 2015/16.

For 2014/15 LSTF funding may contribute to capital costs for companies across Liverpool City Region (some conditions apply), through the Employer Small Infrastructure Grant.

In addition to the above Liverpool Chamber has access to European Green capital funding.

Private sector funding is becoming increasingly available for investment primarily in rapid charging infrastructure. There are now several organisations including Engenie and Siemens who have offered to co-fund OLEV funding, which may influence the overall regional scheme.
3.2 Initiative Two - Developer focus

3.2.1 Overview

Planning policies can be instrumental in building up EV charging infrastructure within new developments. If planned in at the earliest stages, it is a very cost effective way of developing a significant charging network across the region.

Planning is an area where the local authority has significant control to implement change. With visibility on development strategies across an authority, planned expansion of the charging network will be mapped out. This allows any “gaps” to be identified, where the public infrastructure should be positioned.

3.2.2 Components of delivery

- All local authorities can commit to developing an LCR wide Supplementary Planning Documents (SPD) or individual SPDs if prepared to support the installation of charging points, for both residential and commercial sites.
- For sites with individual dwelling car parking provision, “EV ready” homes can be developed for costs as low as £100 per dwelling.
- For sites with shared or limited parking, the installation of publically accessible charging points should be included in general parking areas.
- Technical requirements and information for developers to develop EV ready homes and commercial sites are attached in appendix 6.

The Low Emission Strategies Partnership, of which Sefton is the lead member, has been developing guidelines for best practice on installation of charging points. The Partnership is also reviewing policy and SPDs from across the UK, and Low Emission Topic Note entitled 'Planning requirements for EV charging' is currently under review, and will be available on the Low Emission Strategies Partnership website by the end of 2013.

The table below shows the recommended “best practice” installations by development type and size, which would develop a significant network of charging points. Sefton Council’s Draft Planning Committee Policy Note, includes recommendation for the following provision:

Table 3: Minimum Provision of Parking Bays and charging points for Electric Vehicles in new developments

---

Houses: All houses with at least one off-street parking space or garage space

One charging point per house (in most cases a domestic 13a socket fixed to an internal or external wall, will cost less than £100)

Plats: At least one or 10%, (whichever is the greater) parking spaces must be marked out for use by electric vehicles only, together with an adequate charging infrastructure and cabling for each marked bay.

All Other Development: At least one or 10% (whichever is the greater) parking spaces must be marked out for use by electric vehicles only, together with adequate charging infrastructure and cabling for each marked bay.

Above requirements includes conversions

<table>
<thead>
<tr>
<th>DEVELOPMENT TYPE</th>
<th>STANDARD</th>
<th>ADVANCED</th>
<th>EXCELLENT</th>
<th>OFF-SET TARIFF²</th>
</tr>
</thead>
<tbody>
<tr>
<td>Residential:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>House with off-road parking</td>
<td>Single/3 Phase¹ 1 point per unit</td>
<td>Single/3 Phase¹ 2 points per 100m²</td>
<td>Single/3 Phase¹ 2 points per 100m²</td>
<td>Contribution to wider community provision²</td>
</tr>
<tr>
<td>House with on-road parking</td>
<td>Single/3 Phase¹ 1 point per 10 units³</td>
<td>Single/3 Phase¹ 2 points per 10 units³</td>
<td>Single/3 Phase¹ 2 points per 10 units³</td>
<td>Contribution to wider community provision²</td>
</tr>
<tr>
<td>Flats/Apartments</td>
<td>Single/3 Phase¹ 1 point per 10 parking spaces (or per 10 units³)</td>
<td>Single/3 Phase¹ 2 points per 10 parking spaces (or per 10 units³)</td>
<td>Single/3 Phase¹ 2 points per 10 parking spaces (or per 10 units³)</td>
<td>Contribution to wider community provision²</td>
</tr>
<tr>
<td>Commercial:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Leisure / Retail</td>
<td>Single/3 Phase¹ 1 point per 200m²</td>
<td>Single/3 Phase¹ 2 points per 200m²</td>
<td>Single/3 Phase¹ 2 points per 200m²</td>
<td>Contribution to on-street provision using same rates²</td>
</tr>
<tr>
<td>Business, Higher Education &amp; Hospitals</td>
<td>Single/3 Phase¹ 1 point per 30 rooms or per 10 parking spaces</td>
<td>Single/3 Phase¹ 2 points per 30 rooms or per 10 parking spaces</td>
<td>Single/3 Phase¹ 2 points per 30 rooms or per 10 parking spaces</td>
<td>Contribution to on-street provision using same rates²</td>
</tr>
<tr>
<td>Hotels &amp; Residential Inst.</td>
<td>Single/3 Phase¹ 1 point per 30 rooms or per 10 parking spaces</td>
<td>Single/3 Phase¹ 2 points per 30 rooms or per 10 parking spaces</td>
<td>Single/3 Phase¹ 2 points per 30 rooms or per 10 parking spaces</td>
<td>Contribution to on-street provision using same rates²</td>
</tr>
<tr>
<td>Industrial:</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distribution &amp; Storage</td>
<td>Single/3 Phase Accelerated¹ 1 point per 10 parking spaces (employees/visitors)</td>
<td>Single/3 Phase Accelerated¹ 2 points per 10 parking spaces (employees/visitors)</td>
<td>Single/3 Phase Accelerated¹ 2 points per 10 parking spaces (employees/visitors)</td>
<td>Contribution to wider community provision²</td>
</tr>
</tbody>
</table>

Note:
- Electric vehicle re-charging is classified as permitted development
- Low emission vehicle infrastructure may form part of Infrastructure Delivery Plans, developed as part of PPS12 – Local Spatial Planning, requirements
- In line with requirements of PPS1 (as amended), provision may be subject to development scheme viability. In determining viability, the emissions impact of a development scheme will be a material consideration
In determining electric vehicle recharging needs, provision should be consistent with specified, maximum parking standards, appropriate to both land use and location, as recommended in PPG13 – Transport.

* Dependent on prevailing vehicle technology requirements. Enabling cabling for provision and upgrade should be provided in anticipation of future requirements, even in circumstances where re-charging provision is not deemed viable from the commencement of the operational phase of the development. Accelerated charging includes both fast and rapid systems.

* Where provision is not identified as part of Community Infrastructure Levy and contribution is sought for <5 development schemes until 2014.

* As per *. Dependent on low emissions assessment and local area need. Requirement included as part of a Section 106 agreement, Town & Country Planning Act 1990, as amended by the Planning and Compensation Act 1991, Section 12.

* As per *. Where no dedicated, off-street parking is provided as part of the development scheme or where on-site provision is not feasible.

* Provision determined following low emission assessment and required as part of a Low Emission Fleet Strategy.

3.2.3 Key Stakeholders

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liverpool City Region</td>
<td>Define, promote, communicate</td>
</tr>
<tr>
<td>Local Authorities</td>
<td>Define, promote, deliver</td>
</tr>
</tbody>
</table>
3.3 Initiative Three - E-Car Club and E-mobility hubs

3.3.1 Overview
Increasingly car clubs are being viewed as an attractive approach to reducing car ownership and operating costs, along with offering the associated benefits of improved air quality, reduced congestion etc.

EVs represent challenges for car clubs in terms of potentially reduced utility due to vehicle range, availability of infrastructure, greater capital costs and potential driver apprehension. However research from Carplus and car club operators across the UK examining trip types, shows that EVs are ideally suited to most car club user requirements whilst also serving to raise the profile and experience of EVs among key populations.

Increasing demand for car clubs is leading to greater innovation and flexibility in applications and operating models. These include organisation specific, public and community operated schemes. Some car clubs, for example Co-wheels, are also finding suitable opportunities to successfully include EVs within their fleets.

To make EVs a viable option within car clubs, user groups need to be carefully assessed so that range and infrastructure meet with their requirements.

3.3.2 Liverpool City Region e-car club offering
The LCR will support the use of electric vehicles in car clubs by:

- Providing car clubs with incentives to include electric vehicles within their operations.
- Reducing the risk for car clubs of including EVs within their fleets
  - Raising awareness of the opportunity to experience EVs within car clubs.
  - Support detailed analysis of user groups to match EVs with suitable users.
  - Facilitating part funded EVs for inclusion within car clubs
  - Facilitating short term leases for EVs included in car clubs
  - Provision of charging infrastructure

3.3.3 Target audience
This initiative will aim to encourage the use of EVs within a range of car club environments and will therefore focus on influencing the behaviour of:

- Car club operators who ordinarily regard EVs as too high risk in terms overall capital cost and operational constraints to be included within schemes.
- Local authorities and other agencies working to promote and establish car clubs within the region.
- Organisations and locations representing opportunities for car clubs.

3.3.4 Benefits for Liverpool City Region
This approach to encouraging the use of EVs within car clubs will:

- Capitalise on the expertise of existing car club operators in establishing schemes.
- Establish sustainable car club operations
- Increase awareness of car clubs
- Increase awareness of EVs
- Increase the use of EVs within car clubs
- Reduce the use of personal vehicles and traffic
- Reduce tail pipe emissions thereby improving local air quality
- Economic opportunities for companies manufacturing, installing, servicing the required vehicles and infrastructure

3.3.5 Benefits for other stakeholders

- Car club operators
  - This will help car club operators manage the risk associated with the first 2 years of operation as vehicle usage begins to build up and consolidate. After the initial interest and sign up of the core user group, the first 2 years is typically the make or break period as use slowly increases and operational losses turn to a break even.
  - To include an EV within a car club requires additional effort to check they meet user requirements and to provide charging infrastructure.
- EV users
  - A wide range of drivers will have the opportunity to experience and test EVs
  - Organisations will be able to test whether EVs meet their operational requirements
- Vehicle manufacturers
  - Vehicle manufacturers will benefit from their products experiencing greater exposure within the region and from drivers being able to have longer test drives before making a purchase decision.

3.3.6 Components of delivery

Liverpool City Council has appointed City Car Club to operate a city wide Car Club. The details of the provision include the roll out of electric cars within the second phase of expansion of the car club implementation.

To ensure the success of a car club, suitable charging infrastructure must be installed in consultation with the car club provider.

1) EVs and charging infrastructure made available to car clubs will be provided from the current OLEV-funded infrastructure and other projects that include provision to increase (or bring forward) the planned phased approach.
2) Agreements for trial vehicles to be included within car clubs will need to be secured from vehicle manufacturers and finance companies.
3) There will need to be a period of engagement with car club to enable them to help scope the support package and develop ownership of the scheme.
4) Car clubs, local authorities and their agencies, large organisations, Chambers of Commerce, operators of business parks etc. will need to be approached to identify and prioritise opportunities.
5) Electric car club locations should be at transport interchange locations, such as outside train stations, to maximise integrated transport.

6) Car club locations should be on-street in highly visible locations where possible, involving the cooperation and support from traffic management teams across the region. A change of land use is required, to develop enforceable electric car club vehicle parking bays.

7) Car club access cards should be integrated with available smart ticketing systems, for ease of use for the users e.g. Merseyside Walrus card.

Other local authorities across the Liverpool City Region will monitor the success rate of City Car Club to inform any future proposals. As the process of tendering for and contracting with the car club has already been completed for one local authority, expanding the service into neighbouring authorities can be seen as an extension of the contract.

Table 4 – Initiative risk assessment

<table>
<thead>
<tr>
<th>Risks</th>
<th>Level of Risk</th>
<th>Party at Risk</th>
<th>Risk Mitigation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lack of demand for EV</td>
<td>Low</td>
<td>Car Club Operator</td>
<td>Market research</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Marketing</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Agreement with organisation prior to launch</td>
</tr>
<tr>
<td>Lack of infrastructure</td>
<td>Low</td>
<td>Car Club Operator / Local Authority</td>
<td>Stakeholder communication</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Planning</td>
</tr>
<tr>
<td>Traffic Regulation Order</td>
<td>Medium</td>
<td>Car Club Operator</td>
<td>Stakeholder communication</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Buy in from all teams</td>
</tr>
<tr>
<td>Operational Problems</td>
<td>Medium</td>
<td>Car Club Operator</td>
<td>Member education</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>SLA in place</td>
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<tr>
<td></td>
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<td></td>
<td>Links with vehicle dealership</td>
</tr>
<tr>
<td>Increased cost of EV = unsustainable operation</td>
<td>Medium</td>
<td>Car Club Operator / Local Authority (removal of EV)</td>
<td>Pump priming</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Minimum guaranteed revenue</td>
</tr>
</tbody>
</table>

3.3.7 Costs

As the car club operator will be providing the service to the region, the majority of costs lie with them. Elements such as the Traffic Regulation Order (TRO) and car club marketing costs will have been included in the contract for car club provision and so will not be additional. The only additional elements to consider are:

- Infrastructure provision (OLEV funding)
- Pump priming to support an EV (option to underwrite the revenue generated by the car club operator if utilisation is low) – a maximum of £500 per month
- Planning SPD (or equivalent) – could require that where it is impractical for developments to put in charging points or for large developments where they could support a car club a financial contribution is made to a pot to support EVs in car clubs. This could be linked to the emissions a development would generate, i.e. more emissions higher contributions.
### 3.3.8 Managed Pool Cars

In locations where car club cars are not suitable, such as on business parks or with large organisations, ICE (i.e. internal combustion engine – e.g. petrol, diesel), electric or hybrid vehicles can be provided with car club booking telematics installed. This allows a low risk, low cost, extremely easy method of managing pool cars. Cars can still be booked on line (or over the phone) and all usage can be monitored. This system can also be set up with authorities outside Liverpool City Council, without affecting the existing contract.

Benefits include:

- Hassle free introduction of electric pool cars into businesses
- No requirement for staff time to set up or provide on-going management of a bespoke pool car system (including agreeing contracts, providing insurance, maintaining the cars etc.)
- Efficient use of vehicles for staff travel, especially where it can provide a real alternative to staff mileage claims through using their own cars.
• Lower costs to the organisations, as they only pay for what they use.
• Easy to integrate other vehicles, including petrol vehicles for longer trips, and electric bicycles.
• Bespoke systems for each location, according to specific requirements.\(^{14}\)
• In some locations the cars can be made available to members of the public out of office hours, contributing to the wider mobility solutions.
• Any costs and contracts are arranged between the end user and the providing organisation, so there is no risk to the Liverpool City Region.

Integrated systems can also provide electric bike usage for companies with managed pool cars.

### 3.3.9 Components of Delivery

- Identify key sites and organisations where pool cars are already, or could be, used.
- Pass relevant contacts onto pool car operator
- Facilitate installation of required charging infrastructure at selected sites.

### 3.3.10 Risks and Costs

This is low risk to the Liverpool City Region, as opportunities are passed directly to the pool car operator. They would commit time and resource to qualify the opportunity based on commercial decisions. The operator would work with the end user to deliver the project.

The only costs associated would be in potential support for charging infrastructure.

### 3.3.11 Cycle and E-Cycle Hire

Liverpool City Council, through LSTF funding, is working to procure a bike hire service operator, which will complement the Bike and Go scheme launched by Abellio which includes Merseyrail and Northern Rail train operating companies operating in the region. The city wide bike hire scheme will have 500 bikes across 50 stations (one way trips permitted), with a planned rapid expansion to 1,000. The scheme is due to launch in spring 2014.

The final specifics of the scheme will be determined by the selected operator, however, it is likely that the docking stations will be mobile units (requiring no civil engineering work), which are easier, quicker and cheaper to place. This allows the sites for the docking stations to be chosen (and moved if required), so sites integrating with alternative forms of transport should be chosen.

However, it does mean that the infrastructure required to support the introduction of electric bikes would be considerably more expensive, as a power supply is required. Therefore, with no intervention, the introduction of electric bikes into the scheme will be phased in slowly, probably after the initial two year set up period.

\(^{14}\) An example of a bespoke proposal is in Appendix 5
As part of the managed pool car service, operators can also offer electric bikes. These are provided specifically for the client, and are not usually available for members of the public to access. However, they do provide an additional sustainable transport option for employees on the relevant sites.

Other local authorities across Liverpool City Region will be able to monitor the success rates of the bike clubs within Liverpool city area. As the process of tendering for and contracting with the bike clubs will have been completed for one local authority, expanding the service into neighbouring authorities could be seen as an extension of the contract.

3.3.12 Components of Delivery

- Identify key sites and organisations where pool bikes are already, or could be, used
- Pass relevant contacts onto pool bike operator
- Provide marketing and communications support
- Facilitate installation of required charging infrastructure at selected sites.

3.3.13 Risks and Costs

As the bike club operator will be providing the service to the region, the majority of costs lie with them. Elements such as the Traffic Regulation Order (TRO) and marketing costs will have been included in the contract for bike club provision and so will not be additional. The only additional elements to consider are:

- Infrastructure provision (OLEV funding)
- ‘Pump priming’ to support electric bikes (option to underwrite the revenue generated by the operator if utilisation is low) – a maximum of £200 per month

3.3.14 Integrated Ticketing

Ease of use for the end user will speed up the adoption of e-mobility schemes, and so having one card to access all forms of transport, and accessing charging points, should be a target. The proposed transport Smart Card ‘Walrus’ for Merseyside would be a focus for this approach.

The potential to develop shared marketing, including integrating the customer sign up process, can develop as schemes come on line. (see section 3.6 on communications).

As the regional charging infrastructure develops, supported by a single back-office system, it is essential that there is communication with public transport operators and bike and car club operators to ensure the communications protocol for accessing the charging points is compatible.

As modes of transport become better integrated, travellers will have one location and one membership to access all options. Future work would include integrating back office systems for fully seamless integration.
Case Study – Fleet Management and Integrated E-Mobility

Project details

Project category: Framework
Timeframe: 2008 - current
Funding: from within NHS, shared revenue with Co-wheels
Partnership:
• North Bristol NHS Trust
• Co-wheels fleet management

Project description

With a desire to provide integrated, low emission transport options for the staff on NHS sites across Bristol, Co-wheels provides managed pool cars (both electric and ICE) along with electric bicycles. These are reserved for the use of the NHS during agreed hours and available to the public at other times. All modes of transport are managed through the Co-wheels booking system. The vehicles can be accessed with public transport cards, such as bus tickets.

Project Objectives

Integrated Travel
• Make available the best mode of transport for a specific journey.
• Ease of use for the end user.

Reduce Cost to the NHS
• Cost effective procurement and management of vehicles, reducing staff mileage costs and fleet management time.
• Revenue generated through public use of the vehicles shared with the NHS.

Increased Active Travel
• Pedal assist electric bikes appeal to a larger range of people than traditional bicycles.
• Longer journeys by bike made possible.

Electric bikes and cars

Project achievements and Impacts

Customer Satisfaction
Feedback from both the NHS and the end users has been very positive. Cost and time savings have been realised by the NHS. The number of people choosing to take electric bicycles is high as is demand for the bicycles.

Replicable Model
The template developed, including integrating forms of transport and revenue sharing, can be replicated in other locations and with more modes of transport.
### 3.3.15 Key stakeholders

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liverpool City Region Partners</td>
<td>Define, promote, deliver, especially car and bike hire schemes and identify opportunities</td>
</tr>
<tr>
<td>Eg Authorities, LEP, Chamber</td>
<td></td>
</tr>
<tr>
<td>Car club operators</td>
<td>Develop and deliver the project and take some ownership of its success</td>
</tr>
<tr>
<td>Bike club operators</td>
<td>Develop and deliver the project and take some ownership of its success</td>
</tr>
<tr>
<td>Large organisations</td>
<td>Potential beneficiaries</td>
</tr>
<tr>
<td>Business park owner/operators</td>
<td>Potential beneficiaries</td>
</tr>
<tr>
<td>Vehicle manufacturers</td>
<td>Participation of vehicles</td>
</tr>
<tr>
<td>Vehicle finance providers</td>
<td>Participation of vehicles</td>
</tr>
</tbody>
</table>
3.4 Initiative Four - Liverpool City Region e-taxis

3.4.1 Overview
Whilst part of the solution to people parking and driving within town centres, taxis (both Hackney Carriages and Private hire vehicles) can also contribute to vehicle emissions and noise. In particular, when parked up, or in stationary traffic, taxis can contribute disproportionately towards air pollution, whilst an EV replacement would contribute nothing.

Taxis are used by a wide variety people and therefore offer exposure of EVs to people who would not normally come into contact with them and potentially encourage uptake and use.

Whilst operating all day or night the vast majority of taxi journeys fit within the range of an EV so if appropriate charging infrastructure is in place, EVs offer taxi companies lower operating costs.

Several taxi and private hire companies operating in Merseyside have expressed interest in operating EVs, and have completed cost analysis based on data from their existing services. This presents the opportunity to support the market adoption of EVs within the LCR taxi fleet and links to the E-Tourism project expanding the provision and use of low emission vehicles to ‘on-demand’.

3.4.2 Offering
- Project delivery partners will provide incentives for taxi owner to include electric vehicles within their fleets.
  - Contribute towards the costs of installing rapid charging infrastructure
  - Provide discounted licences for e-taxi drivers
  - Provide preferential e-taxi bays with charging points.
  - Promote e-taxi operations and routes.
  - Include and promote e-taxis within the e-visitor proposition

3.4.3 Target audience
- Taxi operators (Hackney and Private?)
- Key relatively predictable routes particularly suited to EV ranges e.g. from the airport to Liverpool City Centre.
- Local Authorities through their licensing process

3.4.4 Benefits for Liverpool City Region
- Improvements in air quality
- Improvements in vehicle associated noise
- Initiate a trend in EVs becoming a significant segment of taxi fleets.
- Raise awareness of EVs amongst a broader population
- Communicate that “if EVs work for taxis, they’ll work for you”

3.4.5 Benefits for other stakeholders
- Provides support for taxis considering switching to EVs
- A greener option for taxi users
- A ‘greener’ option for companies with taxi contracts
- Economic opportunities for companies manufacturing, installing, servicing the required vehicles and infrastructure
3.4.6 Components of delivery
1) Communicate the vision to taxi and private hire firms across the region
2) Identify priority routes, suitable for deploying EVs
3) Work with taxi and private hire companies to support their existing plans for EV adoption
4) Identify potential vehicles, and ensure they can easily be registered
5) Identify taxi rank locations with preferred operating companies and confirm charge point requirements
6) Undertake site and cost assessments
7) Identification and use of licensing and planning processes to support implementation

3.5.7 Challenges

- Difficulties can arise if a new Hackney Carriage Licence is required.
- If drivers are self-employed there may be resistance to adopting EVs, as they would not be able to complete the longest (and most profitable) journeys.
- Rapid charging facilities should be in place at taxi ranks.
- Taxis on charge cannot wait in a rolling queue – there would have to be a place holder.
- Many taxi drivers take their vehicles home when off duty. This adds to the mileage and domestic recharging facilities may have to be provided
- Vehicle cost
3.5.8 Key stakeholders

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liverpool City Region</td>
<td>Define, promote</td>
</tr>
<tr>
<td>Merseytravel</td>
<td>Define, promote</td>
</tr>
<tr>
<td>Local authorities</td>
<td>Define, promote, deliver</td>
</tr>
<tr>
<td>Taxi operators</td>
<td>Beneficiaries and help define and deliver</td>
</tr>
</tbody>
</table>
3.5 Initiative Five - Liverpool City Region E-visitor (E-Tourism)

3.5.1 Overview

There is a desire amongst stakeholders to communicate the green credentials of the region to those who visit, particularly through the ambitions of the Liverpool Green Partnership and Mayoral Commission for Transport and Climate Change.

There is also a desire to translate the ‘welcoming’ culture of Merseyside and its position as a popular tourist destination into a joined up offering to visitors whereby they can fulfil their short term local travel requirements through the use of e-mobility.

This initiative not only requires there to be an e-mobility infrastructure in place but also an incentive to use e-mobility. This incentive will include convenience, novelty, environmental benefits and also add-on benefits provided by partners keen to be associated with the project eg special offers, discounts.

3.5.2 Liverpool City Region e-visitor offering

- The project delivery Partnership takes the lead in developing and delivering a joined up regional e-visitor offering.
- Organisations participating in E-visitor will have access to Initiative One (the main vehicle trial offering) as it develops.
- E-visitor will include hire cars, car clubs, taxis, electric bikes and electric buses.
- Services will focus on key visitor groups
- The offering will have service partners able to provide additional incentives such as reduced admission fees for visitor attractions, priority parking, discounts of meals, rooms etc.
- The e-visitor offering will all be linked through an e-mobility card providing ID, access to charging infrastructure, destination admission etc. This could link with any smart ticketing product that is developed for the city region.

3.5.3 Target audience

This initiative will aim to encourage the use of EVs amongst a range of visitors to the region including:

- Business visitors
- Conference visitors
- Visitors using main transport hubs including the airport and railway stations
- Day trippers
- Visitors to specific areas and with specific requirements – i.e. e-bikes for people holidaying in Southport or spending a weekend in Liverpool City Centre, e-bikes or e-taxi links to regional tourist sites and visitor attractions
- Users of taxis
- Users of hire cars
3.5.4 Benefits for Liverpool City Region
- Communicates a strong environmental message to visitors
- Provides a low emission, high quality, innovative service for visitors and potential investors / employers
- Creates an additional attraction for visitors
- Trials the inclusion of EVs within a broad cross section of the transport infrastructure and amongst a wide range of service providers and other stakeholders.
- Involves the creation of a sophisticated joined up solution
- Economic opportunities for companies manufacturing, installing, servicing the required vehicles and infrastructure

3.5.5 Benefits for other stakeholders
- Visitors
  - Provides a convenient, low carbon, joined up mobility solution
  - Provides an additional novelty attraction during a visit to Liverpool City Region.
- Transport service providers
  - Provides a low risk opportunity for a range of transport operators and service providers to experience the use of EVs in a wide range of applications.
- Visitor service providers
  - Enables a range of businesses to benefit from being associated with a joined up visitor offering.
  - Enables sites to benefit from the installation of charging infrastructure.
- Vehicle manufacturers
  - Enables a wide range of users to experience EVs
  - Enables a wide range of businesses to trial EVs
  - Raises the profile of EVs across a very large stakeholder group

3.5.6 Components of delivery
- Create and agree the vision
- Confirm stakeholder group with a strong buy in from the tourism economy
- Strong partnership working is essential to maximise the impact from other initiatives, and e-visitor benefits are additional elements to the core deliverables.
- Creation of component supporting projects e.g. marketing, ticketing combinations
- Integration of E-tourism project with current activity, service and infrastructure provision
Case Study - E-Tourism

Project details

Project category: Demonstration/delivery

Timeframe: April 2013 - Current

Funding: Go Lakes, Co-wheels

Partnership:
- Go Lakes Tourist Board
- Lake District Park Authority
- First Pennine Rail
- Co-wheels

Project description

Three electric Twizy and one electric Kangoo van are available through the Co-wheels car club scheme at railway stations and key tourist sites in the Lakes District. Information about the scheme including how to join Co-wheels and book the electric cars is presented when booking train tickets through First Pennine.

The electric cars are also available at several key hotels, and information and membership options are available at reception. Cars are also located at tourist sites, such as Coniston Lake, linking transport options through the Lake District.

Project Objectives

Reducing Congestion and Emissions
- Encouraging travel to the Lake District by train and around the Lake District by hired car and public transport, reducing the number of cars arriving into the area.
- An electric van and traditional ICE vehicles are available through the scheme, to ensure all journey types are catered for.

Project achievements and Impacts

Successful Utilisation

Over 45 members of the public used the Twizy electric cars over the summer season, with very positive responses. The vehicles are being used in rural areas, up and down steep hills demonstrating that they are fit for purpose outside of the urban environment.

Support from Tourism Sites

Hotels with charging points and the Twizy on offer are getting good responses to the initiative, and are keen to promote the scheme further. Some have reported an increase in visitors directly attributed to the Twizy.
### 3.5.7 Key stakeholders

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liverpool City Region Partners</td>
<td>Define, promote, deliver, communicate</td>
</tr>
<tr>
<td>E.g. Authorities, Merseytravel LEP, Chamber</td>
<td></td>
</tr>
<tr>
<td>Visitor destinations</td>
<td>Potential beneficiaries and contributors to joined up premium offering, deliver</td>
</tr>
<tr>
<td>Transport operators</td>
<td>Potential beneficiaries and contributors to joined up premium offering</td>
</tr>
<tr>
<td>Accommodation and hospitality providers</td>
<td>Potential beneficiaries and contributors to joined up premium offering, deliver</td>
</tr>
<tr>
<td>Vehicle finance provider</td>
<td>Confirm participation of vehicles</td>
</tr>
<tr>
<td>Vehicle manufacturers</td>
<td>Confirm participation of vehicles</td>
</tr>
</tbody>
</table>
3.6 Initiative Six - Marketing and Communications

3.6.1 Overview

The initiatives delivered through this strategy will work towards increasing the patronage, use and purchase of electric vehicles (and other low emission transport) by the targeted audiences (i.e. public, private companies and local authorities) and support the economic development (specifically low carbon elements) through the provision of business opportunities related to the manufacture, delivery and maintenance of vehicles, infrastructure and services. To capitalise on the market development and increase the uptake of EVs, relevant, accurate and comprehensive information will be made available to as wide an audience as possible. The decision making process to switch to electric vehicles is complex, and requires a more significant information gathering stage than for internal combustion engine vehicles. Moving away from vehicle ownership and utilising different forms of e-mobility and integrated transport options also requires behaviour change and links into other programmes in the LCR supporting sustainable travel choices with the public, schools and businesses e.g. Smarter Choices and LSTF work.

3.6.2 Benefits to Liverpool City Region

Effective communication and provision of information can significantly aid the decision making process, both for individuals and fleet managers and companies.

Innovative e-mobility initiatives bringing together the region and increasing the number of EVs on the road will be of interest to city regions and central government, and the Liverpool City Region will benefit from effective dissemination of the projects.
3.6.3 Components of Delivery

Each initiative will be delivered with specific communication and dissemination for that project, developing detailed marketing materials and case studies as required. However a central point of information should bring all elements together.

- **Develop a website (initially through current Smarter Choices and Merseytravel sites)**
  - Collate information for individuals and fleet customers
  - Information on vehicle types, costs, benefits and suitable utilisation
  - Information the recharging requirements, including installation considerations or access them as appropriate
  - Information on dealerships and support services in the region, including elements such as insurance and breakdown cover provision
  - Examples and case studies demonstrating success stories of vehicles, infrastructure and services
  - Information to include other sustainable transport options, including integrated links to their sites (building to full integration of systems in due course)
  - Maps of recharging locations
    - Opportunity to provide journey mapping and range / recharging facilities information specific for each customer
  - Contact details for support and links to specialist and Partner websites
3.6.4 Costs
Funding for a website could come from contributions from each Local Authority within their sustainable transport communication budgets but initially existing resources will be used eg Smarter Choices / TravelWise and Partner website areas. Competitive quotes for a separate information only website would be in the region of £10,000. Interactive mapping tools would increase this, and integrated membership areas and the ability to complete financial transactions can increase costs up to £50,000.

3.6.5 Stakeholders

<table>
<thead>
<tr>
<th>Stakeholder</th>
<th>Contribution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Liverpool City Region</td>
<td>Define, promote, deliver</td>
</tr>
<tr>
<td>Merseytravel</td>
<td>Define, promote, deliver, host and coordinate</td>
</tr>
<tr>
<td>Local authorities</td>
<td>Define, promote, deliver</td>
</tr>
<tr>
<td>Project partners</td>
<td>Provide information</td>
</tr>
<tr>
<td>Transport operators</td>
<td>Support</td>
</tr>
</tbody>
</table>
3.7 Initiative Seven - Charging Point Location Decision Making

3.7.3 Overview

The E-mobility initiatives in this strategy are underpinned by the successful bid to OLEV in 2013 for the provision of charging posts, on public sector land and rail stations. The location of these charging points has been largely determined by the project partners who have already committed resource and established a requirement for the infrastructure.

However, ensuring charging points are placed in optimal locations is vital to maximise their use. Early movers installing regional infrastructures, such as those in the first stages of the Plugged in Places initiatives experienced some problems with initial locations, leading to underutilisation and eventual re-location of posts. To avoid this, a hierarchy of elements to consider should be consulted when planning locations.

This should be an easy reference point to refer to for the installation teams making the final site selection, especially where there may be several options in the same area. While the access to power supply is essential, posts should not be installed just because they can be in a location, if they do not attract scores on the other elements.

A selection process based on the example criteria set-out in the table below would be developed and utilised by all current and potential Partners in the strategy delivery team to decide on the most suitable sites for infrastructure installation.
### Location/Area

<table>
<thead>
<tr>
<th>Location/Area</th>
<th>Access to power supply(^{15})</th>
<th>Robust localised energy supply(^{16})</th>
<th>Ability to change land use</th>
<th>Low requirement for civil engineering</th>
<th>High visibility / footfall</th>
<th>Easy and safe to walk to</th>
<th>Accessible for charging cable – all vehicles(^{17})</th>
<th>Close proximity to employment site</th>
<th>Proximity to existing public transport points</th>
<th>Area covered by AQMA</th>
<th>In place to support tourist site</th>
<th>Proximity to other charging bays</th>
<th>Additional facilities on site</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 e.g. Moorfields</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>2 e.g. Dale Street</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

\(^{15}\) Site survey required to establish exact proximity  
\(^{16}\) Communication with Distributed Network Operator (DNO) required  
\(^{17}\) The location of the on-car charger means that the specific placing of the charging point should be considered – especially on one-way or narrow streets
4 Partners and Stakeholders

The Merseyside Transport Advisory Group will form a significant part of the core group that will oversee, develop projects, drive and implement this strategy. All of the local authorities will feed into the decisions taken about delivery of the specific initiatives, including what priority they should take, both within the local authority and on a wider basis as part of the Liverpool City Region. As an LTP output / deliverable this approach will be led via the appropriate co-ordination mechanisms.

Diagram 1: Strategic Delivery Group Structure and Membership
5 Delivery and Time Scales

Each of the initiatives have been developed to be delivered as a discrete project, but there is significant value in developing them in parallel as they provide additional value to each other.

The 2013 DfT OLEV funding for infrastructure projects installation of charging points will start in Q2 2014. To maximise the fast utilisation of the charging infrastructure, and therefore start to generate a revenue stream quickly, steps should be taken to deliver several of the initiatives in line with the installation programme. Some initiatives require more development time, some will cover a finite period of time and some will be on-going.

It will be a requirement of Merseytravel and the Local Authorities to drive this strategy forward and it is anticipated that potential ‘quick wins’ that could potentially be easily implemented by these organisations such as the EV Fleet Review, EV Fleet and Salary Sacrifice of low emission vehicles. Once some of these initiatives have been adopted by Merseytravel and the Local Authorities then they can be targeted at other organisations and businesses in the Liverpool City Region.
### 6 E-Mobility Implementation Plan

<table>
<thead>
<tr>
<th>Initiative</th>
<th>Lead Organisation</th>
<th>Support Organisations</th>
<th>Start Date &amp; Timescale for Implementation</th>
<th>Tasks to complete</th>
<th>Funding Source</th>
<th>Info already available</th>
</tr>
</thead>
</table>
| 1. EV Vehicle trial & leasing process | Could be delivered under framework contract/joint procurement process | Potential for Merseytravel to set up joint framework contract. | Q2 2014 12-24 months | • EV fleet review  
• Appoint private supplier  
• Salary sacrifice scheme development | • EV suppliers/contract hire  
• Local Authorities  
• DfT | |
| 2. Developer Focus | Each Local Authority to develop theirs. | Scope for regionally agreed approach to set equal conditions across LCR. Suggest one lead / co-ordinator. | Q2 2014 6-18 months | • Amendments to planning policy SPD | • Officer time only | Examples from other LA’s |
| 3. E-car club & Integrated E-Mobility | LCC as they have introduced a car club “Outsourced” to e-mobility operator for site specific sub-projects. Liverpool City Council currently have operational car club. | | Q4 2014 12-24 months | • Business case for scaling to other LCR authorities | • Local Authorities  
• Private companies | LCC will be able to provide experience of their scheme |
<p>| 4. E-taxi | Market led | LA’s and | Market led | • Licensing issues | • Rapid charging | |</p>
<table>
<thead>
<tr>
<th>5. E-tourism</th>
<th>Liverpool / St Helens Chamber of Commerce</th>
<th>Liverpool and St. Helen’s Chambers of Commerce have expressed significant interest</th>
<th>From Q2 2014 (as infrastructure is installed) On-going development</th>
<th>• Engage with tourism industry to make them aware of EV infrastructure on offer • Joint marketing and promotion</th>
<th>• Would look to be funded from tourism sector with support from ourselves</th>
</tr>
</thead>
<tbody>
<tr>
<td>6. Marketing/Communications</td>
<td>Merseytravel for charging posts and Local authorities</td>
<td>Use of current Smarter Choices / TravelWise website with links to local authority websites</td>
<td>Q1 2014 On-going</td>
<td>• Develop brand for charging posts scheme • Central website will be develop for charging posts</td>
<td>• Existing LA &amp; M’travel budgets</td>
</tr>
<tr>
<td>7. LCR Charge Point location matrix &amp; future development of infrastructure</td>
<td>Merseytravel</td>
<td>Available to all local authorities to support common decision-making</td>
<td>Q1 2014, agreed matrix Q3 2014 Matrix 6-12 months</td>
<td>• Develop criteria for charge point matrix</td>
<td>• Govt. funding • Existing LA funding • EU funding</td>
</tr>
</tbody>
</table>
| 8. E-freight | Sefton MBC | As part of regional / LTP approach to Freight | Q3 2014 Study 6-18 months | • Funding – Merseytravel  
• Delivery – Sefton MBC | • Potential for EU funded projects to be developed | Consolidation centres, Clipper example from Regent St. in London |

---

8. E-freight

Sefton MBC

As part of regional / LTP approach to Freight

Q3 2014 Study 6-18 months

• Funding – Merseytravel  
• Delivery – Sefton MBC

• Potential for EU funded projects to be developed

Consolidation centres, Clipper example from Regent St. in London
## Appendix 1: Car Club Models

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
<th>Benefits</th>
<th>Disadvantages</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Informal</td>
<td>• Low technology, shared cars</td>
<td>• Easy to set up</td>
<td>• Limited number of people</td>
<td>Saltwell neighbourhood scheme</td>
</tr>
<tr>
<td></td>
<td>• No on-board telematics</td>
<td>• Low cost</td>
<td>• Access can be restricted</td>
<td></td>
</tr>
<tr>
<td></td>
<td>• Keys held in central location</td>
<td>• Community focus</td>
<td>• Individual responsible for insurance, maintenance etc</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Tend to be older cars</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Easy to set up</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Low cost</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>• Community focus</td>
<td></td>
</tr>
<tr>
<td>Membership cars</td>
<td>• Vehicle donated to a car club</td>
<td>• Low set up costs</td>
<td>• Older vehicles</td>
<td>Co-wheels in Oxford has several “member” cars</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Low rental rates for members</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Community Interest Company</td>
<td>• Not for profit “pay by the hour” car hire service</td>
<td>• Revenue re-invested into scheme</td>
<td>• Possible less buying power with suppliers</td>
<td>Co-wheels</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Able to set up in rural areas (less desirable for commercial operators)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Wider social objectives (eg employment policies)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Increased flexibility to react quickly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Commercial Operator</td>
<td>• For profit “pay by the hour” car hire service</td>
<td>• Professional service</td>
<td>• Prices for members can be higher</td>
<td>City Car Club, Zipcar, Hertz on Demand</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• High quality systems</td>
<td>• Will only operate in commercially beneficial locations</td>
<td></td>
</tr>
<tr>
<td>One Way Trips</td>
<td>• Members are able to return cars to any legal space within a certain urban area</td>
<td>• Flexibility for members</td>
<td>• Higher operational requirements to ensure spread of vehicles</td>
<td>Autolib - Paris</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Shorter booking times possible</td>
<td>• Access required to all legal</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E-Car-Clubs</td>
<td>Electric cars only in a “pay by the hour” car hire service</td>
<td>Low emission</td>
<td>Limited range per journey</td>
<td></td>
</tr>
<tr>
<td>----------------------</td>
<td>------------------------------------------------------------</td>
<td>---------------</td>
<td>---------------------------</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Low noise</td>
<td>Extended time required</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Increase the reach of EVs</td>
<td>between trips to recharge</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Additional technical barrier</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>for new members</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parking spaces</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Developer Car Club</th>
<th>Car club provision located in a development specifically for the residents</th>
<th>Reduce car ownership in new developments</th>
<th>Without careful planning cars are under utilised</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>Beneficial to car club operator in reducing / removing set up costs</td>
<td>May be single car in an area, not part of a wider fleet</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Parking spaces</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>E Car Club</th>
</tr>
</thead>
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<table>
<thead>
<tr>
<th>Kelham Island, Sheffield, City Car Club</th>
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<table>
<thead>
<tr>
<th>Parking spaces</th>
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</thead>
</table>
## Appendix 2 - Glossary of Terms

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Full Description</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>EV</td>
<td>Electric Vehicle / Electric Car</td>
<td>A vehicle powered, in part or in full, by a battery that can be directly plugged into the mains. In short: any vehicle that can be plugged in.</td>
</tr>
</tbody>
</table>
| Pure-EV/ Pure-Electric Car | Pure-Electric Vehicle  
Alternative descriptions:  
- Electric  
- All Electric  
- Battery Electric Vehicle (BEV)  
- Fully Electric | A vehicle powered solely by a battery charged from mains electricity. Currently, typical pure-electric cars have a range of approximately 100 miles. |
| PHEV         | Plug-in Hybrid Electric Vehicle  
Alternative descriptions:  
- Plug-In Hybrid Vehicle (PHV) | A vehicle with a plug-in battery and an internal combustion engine (ICE). Typical PHEVs will have a pure-electric range of over 10 miles. After the pure-electric range is utilised, the |
Vehicle reverts to the benefits of full hybrid capability (utilising both battery power and ICE) without range compromise.

<table>
<thead>
<tr>
<th>E-REV</th>
<th><strong>Extended-Range Electric Vehicle</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Alternative descriptions:</strong></td>
<td></td>
</tr>
<tr>
<td>- Range Extended Electric Vehicle (RE-EV) Series hybrid</td>
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</tbody>
</table>

A vehicle powered by a battery with an ICE powered generator on board. E-REVs are like pure-EVs but with a shorter battery range of around 40 miles. Range is extended by an on board generator providing many additional miles of mobility. With an E-REV the vehicle is still always electrically driven.

<table>
<thead>
<tr>
<th>Hybrid</th>
<th><strong>Hybrid</strong></th>
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<tbody>
<tr>
<td><strong>Alternative descriptions:</strong></td>
<td></td>
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<tr>
<td>- Hybrid Electric Vehicles (HEV)</td>
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<tr>
<td>- Normal hybrid</td>
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<tr>
<td>- Parallel hybrid</td>
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<tr>
<td>- Standard hybrid</td>
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</tbody>
</table>

A hybrid vehicle is powered by, either or both, a battery and an ICE. The power source is selected automatically by the vehicle, depending on speed, engine load and battery charge level. This battery cannot be plugged in; charge is maintained by regenerative braking supplemented by ICE generated power. A number of fuels can power hybrid ICES, including petrol, diesel,
Compressed Natural Gas, Liquid Petroleum Gas and other alternative fuels.

<table>
<thead>
<tr>
<th>Type</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td><strong>Full Hybrid</strong></td>
<td>A full hybrid has the same attributes as a hybrid (above) plus the ability to operate solely on battery power although the battery cannot be plugged in.</td>
</tr>
<tr>
<td><strong>Mild Hybrid</strong></td>
<td>A mild hybrid vehicle cannot be plugged in, nor driven solely on battery power.</td>
</tr>
<tr>
<td><strong>Micro Hybrid</strong></td>
<td>A micro hybrid normally employs a stop-start system and regenerative braking which charges the vehicle’s 12 v battery.</td>
</tr>
<tr>
<td><strong>Stop-start Hybrid</strong></td>
<td>A stop-start system shuts off the engine when the vehicle is stationary. An enhanced starter is used to support the increased number of engine starts required in a stop-start vehicle.</td>
</tr>
</tbody>
</table>
AFV | Alternatively Fuelled Vehicle | Any vehicle which is not solely powered by traditional fuels (i.e. petrol or diesel) is referred to as alternatively fuelled.

ICE | Internal Combustion Engine | Petrol or diesel engine, including those adapted to operate on alternate liquid or gaseous fuels.

Industry Terms

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
<th>Explanation</th>
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</thead>
<tbody>
<tr>
<td>Range anxiety</td>
<td>Range anxiety refers to the fear people have about the distance an EV can drive and the concern that the range may not be enough to reach their destination</td>
<td>Communication / experience of EVs is required to allay this fear by explaining how EVs can meet the needs of many journeys</td>
</tr>
<tr>
<td>Plug-In Car Grant</td>
<td>The government grant to reduce the purchase cost of eligible pure-electric, plug-in hybrid and hydrogen cars by</td>
<td>Started in January 2011, available on numerous makes and models.</td>
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<tr>
<td></td>
<td>25% (to a maximum of £5,000)</td>
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<td>--------------------------------</td>
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</tr>
<tr>
<td><strong>Plug-In Van Grant</strong></td>
<td>The government grant to reduce the purchase cost of eligible pure-electric, plug-in hybrid and hydrogen commercial vans by 20% (to a maximum of £8,000)</td>
<td>Started in February 2012, available on numerous makes and models.</td>
</tr>
<tr>
<td><strong>Plugged-In Places</strong></td>
<td>The government scheme to trial a range of charging technologies in regions around the UK which will inform roll-out plans for a UK-wide infrastructure network.</td>
<td>Other locations, in addition to Plugged-In Places, will also be installing charge points</td>
</tr>
<tr>
<td><strong>OLEV</strong></td>
<td>The Office of Low Emission Vehicles</td>
<td>A cross governmental department to govern and develop the low carbon vehicle market and supply chain. Issuing body for Plugged in Places, Plug in car and van grant etc.</td>
</tr>
<tr>
<td><strong>Interoperability</strong></td>
<td>The ability to use all charging infrastructure installed.</td>
<td>With several operating systems across the UK and Europe, OLEV is working to ensure that interoperability allows EV users access to all systems without multiple memberships.</td>
</tr>
<tr>
<td>Back Office System</td>
<td>The booking and billing system supporting the posts in the ground</td>
<td>The major systems in the UK now (October 2012) include Charge Your Car, Source London, Source East, and Polar. The back office controls the access to the posts within a particular system.</td>
</tr>
</tbody>
</table>

**Battery and Charging Glossary**

<table>
<thead>
<tr>
<th>Charge Times</th>
<th>Charge time</th>
<th>The time it takes to charge an EV. EVs require different lengths of time to charge according to the size of the battery, how much charge is left in the battery before charging and the type of charger used. The information below is based on the example of a pure-electric car to illustrate the most extreme charge time. PHEVs and E-REVs will take less time to charge.</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Charge Times</strong></td>
<td><strong>Charge time</strong></td>
<td><strong>Standard charge (3kW)</strong></td>
</tr>
<tr>
<td></td>
<td>Alternative terms:</td>
<td>Alternative terms:</td>
</tr>
<tr>
<td></td>
<td>• EV charge time</td>
<td>• Slow charge</td>
</tr>
<tr>
<td></td>
<td>• Recharge time</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>It will take approximately six to eight hours to charge the average pure-electric car. This can occur at home.</td>
</tr>
<tr>
<td>Normal charge</td>
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<tr>
<td>---------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Fast charge (7kW)</strong>&lt;br&gt;Alternative terms:&lt;br&gt;• Faster charge</td>
<td></td>
<td></td>
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<tr>
<td>Fast charge will normally occur at dedicated charge bays rather than at home. This will fully charge an average pure-electric car in three to four hours.</td>
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<td></td>
</tr>
<tr>
<td><strong>Rapid charge (25-50kW)</strong>&lt;br&gt;Alternative terms:&lt;br&gt;• Quick charge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Rapid charge will only occur at dedicated charge bays. This will charge the average pure-electric car in around 30 minutes.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Opportunity charge</strong>&lt;br&gt;Alternative terms:&lt;br&gt;• Top up charge</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Opportunity charging means the vehicle is charged whenever there is a chance to do so, allowing the battery to be topped up, for example, at a supermarket whilst you shop.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Cycle</strong>&lt;br&gt;Alternative terms:&lt;br&gt;• Name plate cycle</td>
<td></td>
<td></td>
</tr>
<tr>
<td>A cycle is the battery charge from completely flat (0% charge) to full (100% charge) and back to flat (0% charge).</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
### Alternative charging methods

<table>
<thead>
<tr>
<th>Charging Method</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Inductive charging</strong></td>
<td>Inductive charging means energy is transferred via an electromagnetic field from one inductor to another inductor, which then stores the energy in the batteries. There is a small gap between the two inductors, meaning energy is transferred wirelessly. This charging method is being developed to charge EVs.</td>
</tr>
<tr>
<td><strong>Battery exchange</strong></td>
<td>Battery exchange systems allow a depleted battery to be quickly exchanged for a fully charged battery at a battery exchange (or swap) station. Vehicles must be specially designed to accommodate battery exchange technology.</td>
</tr>
</tbody>
</table>

#### Charging locations

<table>
<thead>
<tr>
<th>Charging Location</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>On Street Charging</strong></td>
<td>Publically accessible charging points, including those in car parks and by the side of roads.</td>
</tr>
<tr>
<td><strong>Work Based Charging Points</strong></td>
<td>Within company car parks, these can be for the use of employees and visitors to those companies only, or provided by a company for all EV drivers.</td>
</tr>
<tr>
<td><strong>Domestic Charging</strong></td>
<td>Specific units installed into</td>
</tr>
<tr>
<td>people's homes provide faster and more convenient charging. The times of charge can be programmed, and use of the unit can be monitored.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 3 – Case Study for Switch EV

Project details

**Project identifier:** 400076 BF042J  
**Project category:** Demonstration  
**Vehicle category:** PC  
**Timeframe:** 1st June 2009 to 31st May 2013  
**Funding:** Grant offered £5.4m total expenditure £10.7m.

**Partnership:**  
- Nissan – Lead Partner  
- Newcastle University  
- AVID Vehicles Ltd  
- Liberty Europe Electric Cars Ltd  
- Simon Bailes Ltd  
- Smith Electric Vehicles Europe Ltd

Project description

The North East's EVADINE electric vehicle trial is one of eight national trials of electric & hybrid vehicles funded by the Technology Strategy Board's £25m Ultra Low Carbon Vehicle Demonstrator Programme. EVADINE delivered 44 new and innovative electric vehicles onto the roads of the North East. The trial started in November 2010 and extended until May 2013. In that time members of the general public were invited to use the vehicles for 6 months as they would their conventional petrol or diesel powered cars.

The trial was unique nationally in that it was operating in conjunction with the 'Plugged in Places' infrastructure project allowing the vehicles to operate in an environment with capable public charging.

**Project Objectives**

**Vehicles Delivered**

- 15 off Nissan Leafs
- 1 off SEV Edison
- 2 off Liberty Range Rovers
- 20 off Peugeot iOn
- 6 off AVID CUE-V

The trial scope included 8 specified deliverables, including:

- Successful delivery to the trial of 44 EVs
- Over 150 trial periods with “real world” drivers
- Data collection from the trial vehicles and subjective data from the drivers
- Awareness raising of EVs in the North East of England
- Increased understanding of electric vehicle recharging, with domestic, commercial and street based charging points, associated with the Plugged in Places project
- Knowledge transfer within the Consortium and the wider business community
- Creation of at least 7 jobs

**Leaf Launch - March 2010**

**Project achievements and Impacts**

**Business Opportunities Realised**

EVADINE supported the partners in their development of EV platform technology. It has helped to prime the electric vehicle market in the UK and has supported investment decisions such as Nissan’s plan to build the new Leaf at Sunderland.

**Market Penetration (quantified)**
EVADINE led to the direct sales of over 20 EVs to trial drivers during the course of the trial, with many more enquiries in process.

**Long term social and Economic sustainability**

All project partners are now employing more people within the specific technology areas involved. Multiple training and education courses specifically for EVs are now in place.

---

**Positive Environmental Impacts (quantified)**

Extensive research from TORG calculated the average emissions from EVs at 85g/km (UK car average 208 g/KM). Additional research has shown a distinct shift towards overnight recharging, when grid emissions are lower, when informing and providing incentives for drivers. Significant improvements in air quality have been seen, especially within urban areas.
## Appendix 4 – EV Trial Vehicle Deployment Plan

**R** – Responsible  
**A** – Accountable  
**S** – Support  
**I** - Informed  
**C** – Consulted

<table>
<thead>
<tr>
<th>Vehicle Deployment Plan RASIC</th>
<th>Project Manager</th>
<th>LCR</th>
<th>Vehicle Supplier</th>
<th>LCR Stakeholders</th>
<th>Charge Point Back office</th>
<th>Infrastructure Installer</th>
<th>Comments / Clarifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Initial meeting</td>
<td>R</td>
<td>A</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Review and develop project scope</td>
</tr>
<tr>
<td>Develop Project Scope</td>
<td>S</td>
<td>R</td>
<td>S</td>
<td>S</td>
<td></td>
<td></td>
<td>Sign off and issue project scope</td>
</tr>
<tr>
<td>Kick Off</td>
<td>R</td>
<td>A</td>
<td>I</td>
<td>C</td>
<td>I</td>
<td>I</td>
<td>Launch the project</td>
</tr>
<tr>
<td>Develop project plan, roles &amp; responsibilities</td>
<td>R</td>
<td>A</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>S</td>
<td>Develop the project detail based on the agreed scope.</td>
</tr>
<tr>
<td>Develop &amp; approve the offering</td>
<td>R</td>
<td>A</td>
<td>S</td>
<td>I</td>
<td>S</td>
<td>S</td>
<td>Agree the costs and terms of the vehicle, insurance &amp; infrastructure</td>
</tr>
<tr>
<td>Activity</td>
<td>Responsible</td>
<td>Approaching</td>
<td>Submitted</td>
<td>Signed</td>
<td>Approved</td>
<td>Completed</td>
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<td>Develop and approve agreement formats.</td>
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<td>Negotiate with Contract Hire Co.</td>
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<td>Develop target customers</td>
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<td>R</td>
<td>S</td>
<td>S</td>
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<td>Type, location, profile</td>
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<tr>
<td>Develop communication strategy</td>
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<td>A</td>
<td>I</td>
<td>S</td>
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<tr>
<td>Electronic medium, website and questionnaire</td>
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<td>Develop communication material</td>
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<td>I (A)</td>
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<tr>
<td>LCR support guidance and approval authority.</td>
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<td>Stakeholder approval where appropriate.</td>
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<td>Launch</td>
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<tr>
<td>'Hard' launch plan</td>
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<td>Contractual detail</td>
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<td>A</td>
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<td>I</td>
<td></td>
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<tr>
<td>'Agree and legally approve agreement detail.'</td>
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<td>Stakeholder engagement</td>
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<td>Prioritised based on target results</td>
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<tr>
<td>Gather interest and applications</td>
<td>R</td>
<td>A</td>
<td>S</td>
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<tr>
<td>Review applications</td>
<td>R</td>
<td>A</td>
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<td>Regular reviews</td>
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<td>* Easy Wins</td>
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<td>Participants in stakeholder companies etc.</td>
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<tr>
<td>* Interested participants</td>
<td>R</td>
<td>S</td>
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<td>Applicant approaches based on marketing</td>
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<tr>
<td>* Target participants</td>
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<tr>
<td>Pro-active recruitment</td>
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<tr>
<td>User recruitment and assessments</td>
<td>R</td>
<td>S</td>
<td>I</td>
<td></td>
<td>S</td>
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<tr>
<td>Assessment and getting ready for sign up</td>
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<td>based on suitability</td>
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<td>Service</td>
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<td>A</td>
<td>I</td>
<td>R</td>
<td>S</td>
<td>Commercial and domestic installs</td>
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<tr>
<td>Infrastructure installation</td>
<td>S</td>
<td>A</td>
<td>I</td>
<td>R</td>
<td>S</td>
<td></td>
<td></td>
</tr>
<tr>
<td>User sign up</td>
<td>R</td>
<td>A</td>
<td>I</td>
<td>S</td>
<td>S</td>
<td>Vehicle and infrastructure agreements</td>
<td></td>
</tr>
<tr>
<td>Vehicle handovers</td>
<td>R</td>
<td>A</td>
<td>S</td>
<td>I</td>
<td>I</td>
<td>Training, inspection by vehicle supplier.</td>
<td></td>
</tr>
<tr>
<td>On-going fleet &amp; participant management</td>
<td>R</td>
<td>S</td>
<td>S</td>
<td>I</td>
<td>S</td>
<td>Deal with vehicle and infrastructure queries and problems.</td>
<td></td>
</tr>
</tbody>
</table>
Appendix 5 – Managed Pool Car and E-Bike

Co-wheels Financial Breakdown of Costs for NHS Business Services Authority

Co-wheels operate as a Community Interest Company social enterprise. The purpose of the operation is to support public sector organisations to reduce costs and make environmental improvements to the way that staff travel is organised. As a Community Interest Company (CIC), Co-wheels does not seek to make profits to pay dividends or bonuses. The company makes a margin to cover the costs of the business operation. Any surplus is re-invested.

The Co-wheels model achieves cost reduction by using experience from other implementations to create the maximum efficiency in the use of the resources. Co-wheels has a particular focus on implementing car club operations in communities and locations that would not be served by commercial operators.

The Co-wheels pricing structure is all inclusive. Our services are:

- Vehicle provision to meet your requirements either on site or through our car club fleet based in convenient locations
- Thorough driver checks on sign-up and in regular intervals
- An online booking and management system
- Self-collection and drop off system with drivers using smartcards to access vehicles
- In car telematics to accurately record trip time and distance
- Smart billing system tailored to your own finance reporting requirements
- Comprehensive insurance
- Fuel & fuel card service
- Servicing, maintenance & repair
- Cleaning and vehicle checks
- 24hr helpdesk
- Marketing materials
• Ability to make the car available out of hours for private use at a preferential rate

Costs

Below are the costs for providing the Co-wheels fleet. There are several options available:

• Corporate membership of Co-wheels, Pay as You Go
  o This allows complete flexibility for the NHS, with no financial commitments
  o Any vehicle on the Co-wheels fleet can be used
  o Clear monthly invoicing will show who has used the vehicles (including mileage completed)
  o As Bridge House is close to existing Co-wheels members, we cannot guarantee availability of the cars for NHS staff, and advance booking is recommended (however there are several Co-wheels cars already located close to Bridge House)

• Block bookings on a Co-wheels car – reserved for NHS staff use during the working week, but made available to other members of the car club at evenings and weekends
  o A lower financial commitment would be required on a monthly basis
  o One car would always be available for your use (during the agreed hours / days)
  o The Co-wheels car remains available for other members out of hours, promoting the community element of the service
  o If an electric car is being used, the range remaining and the limited hours of the Dean Street car park will have an impact on Co-wheels’ potential to generate revenue outside of NHS staff usage
  o There is a small risk that the electric car will be used by a member of the public overnight, and therefore not be 100% charged at the start of the block booking time.

• Car provision exclusively for NHS staff usage
  o The car would always be available, and always be able to charge over night
  o Clear and predictable monthly invoices
  o Potential to make last minute bookings is increased

For options 2 and 3, Co-wheels agree a threshold of annual mileage with each organisation (usually 10k miles per year per car). Cost is determined at the agreed level and this allows an easy calculation of the cost per mile. Any mileage undertaken over the agreed threshold is charged at a rate of 25p per mile which gives a real incentive to make the service run efficiently. The monthly cost takes into account potential revenue from Co-wheels members outside of the NHS.

Driver sign-ups are charged at a reduced rate of £10 per person which includes a DVLA license check and delivery of smartcard.

Page 62 of 67
The NHS is exempt from paying VAT on our services, but does have to pay VAT on fuel. Therefore, we have shown the costs here with VAT claimed back. We would charge fuel at cost price, in the region of 12p per mile.

**Vehicle Costs**

**Hybrid Car**

The Yaris Hybrid is a medium sized car that creates significant benefit from its dual drive modes. It does 81 MPG and uses electric drive for much of the time on urban journeys.

At 10k miles the Yaris Hybrid would save 1,280kg CO2 per year compared with average NHS grey fleet of 159g/km. The car has combined emissions of 79g CO2/km

It would be worth considering a hybrid vehicle because:

- It removes all range restrictions for journeys
- It removes “range anxiety” from the drivers
- If it is not plugged in correctly overnight, or there is a problem with the charging point, the car can still be used
- It is still low emission and low cost

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Annual cost</th>
<th>Cost per mile for comparison</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exclusive Use</td>
<td>£5,401</td>
<td>£0.66</td>
</tr>
</tbody>
</table>
Electric Car

The Nissan Leaf is a medium sized electric car that creates significant benefit by having no tail pipe emissions. It does 161 MPG (equivalent) and uses only electric drive.

<table>
<thead>
<tr>
<th>Electric Car – Nissan LEAF</th>
<th>8000 miles p/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario</td>
<td>Annual cost</td>
</tr>
<tr>
<td>Exclusive Use</td>
<td>£7,526</td>
</tr>
</tbody>
</table>

Second hand, small Electric Car

The Peugeot iOn is a smaller (although still 5 door) electric car. The second hand car will have completed approx. 10,000 miles, and be comprehensively serviced as well as covered by a maintenance schedule.

<table>
<thead>
<tr>
<th>Small Electric Car - Peugeot iOn</th>
<th>8000 miles p/a</th>
</tr>
</thead>
<tbody>
<tr>
<td>Scenario</td>
<td>Annual cost</td>
</tr>
<tr>
<td>Exclusive Use</td>
<td>£5,600</td>
</tr>
</tbody>
</table>
Electric Bicycles

In addition to a core fleet of cars, Co-wheels can provide electric bicycles (and standard bikes), providing a more sustainable and healthy alternative travel choice for staff. In other implementations we have seen an improvement in the efficiencies of car fleets by providing bikes, as some members of staff choose to use the bikes for shorter journeys, freeing the cars up for longer trips where they are more efficiently applied.

Alongside a range of Giant electric bikes, our service includes the following:

- Bikes come complete with lights, panniers, odometer, cycle lock and insurance.
- The lease agreement includes a comprehensive maintenance and support package with complete repair and parts or whole bike replacement.
- All bikes are fully insured.
- Each lease (usually 2 or 3 years) is tailored with the right support package to meet the needs of your organisation.
- We provide on-site maintenance, servicing, repairs and a call-out response service to keep you cycling.
- Each bike has a unique identifier with the emergency number for users.
- Skilled mechanics train new users how to take care of their electric bikes but will always be available to come out should anything go wrong.
- All bikes are regularly serviced and a full service history is maintained for each bike.

The cost varies dependent on number of bikes, length of lease and payment profile (e.g. payment in advance can reduce cost). However, indicative charges are £100 per electric bike, per month to lease. In addition to the above, the bikes will be available to book online alongside the cars and also available for staff to hire overnight and at weekends at preferential rates so can also be used for commuting.
Appendix 6 – Technical Specifications for EV Ready Homes

EV ready domestic installations

- On average around 70% of the total cost of the installation of a domestic charge unit post building completion are the electrical installation costs. This can be significantly reduced with minimal infrastructure installed at the build out phase, eliminating expensive electrical additions after completion.
- Cable and circuitry ratings should be of adequate size to ensure a minimum continuous current demand for the vehicle of 16A and a maximum demand of 32A (which is recommended for Eco developments).
- A separate dedicated circuit protected by an RCBO should be provided from the main distribution board, to a suitably enclosed termination point within a garage, or an accessible enclosed termination point for future connection to an external charge point.
- The electrical circuit shall comply with the Electrical requirements of BS7671: 2008 as well as conform to the IET code of practice on Electric Vehicle Charging Equipment installation 2012 ISBN 978-1-84919-515-7 (PDF)
- If installed in a garage all conductive surfaces should be protected by supplementary protective equipotential bonding.
  - For vehicle connecting points installed such that the vehicle can only be charged within the building, e.g. in a garage with a (non-extended) tethered lead, the PME earth may be used.
  - For external installations the risk assessment outlined in the IET code of practice must be adopted, and may require an additional earth stake or mat for the EV charging circuit. This should be installed as part of the EV ready installation to avoid significant on cost later.

EV ready commercial installations

- Commercial and industrial installations may have private 11,000/400 V substations where a TN-S supply may be available, simplifying the vehicle charging installation design and risk analysis. It is therefore essential for developers to determine the building’s earthing arrangements before installation.
• Commercial vehicles have a range of charge rates and it is appropriate to consider a 3 phase and neutral supply on a dedicated circuit emanating from a distribution board.
• More than one EV charging station can be derived from a source circuit, but each outlet should be rated for a continuous demand of 63Amps. No diversity should be applied throughout the EV circuitry. 3 phase RCBOs should be installed and the supply terminated in a switched lockable enclosure.
• If an external application (for example car park or goods yard) is selected, the supply should be terminated in a feeder pillar equipped with a multi-pole isolation switch, typically a 300mA RCD, a sub-distribution board (if more than one outlet is fed from the pillar). If an additional earthing solution is required, the earth stake can be terminated within this pillar.