Electric Vehicle Recharging Strategy 2016-2026

London Borough of Richmond-upon-Thames

December 2016

LONDON BOROUGH OF
RICHMOND UPON THAMES

Contents

Executive Summary

Richmond's residents and businesses will be able to use electric vehicles every day and for any purpose. They will be confident that they will be able to recharge them quickly and conveniently, taking advantage of their lower cost operation and in doing so helping improve air quality.

Richmond borough is an Air Quality Management Area, with residents frequently experiencing levels of particulate matter (PM10) and nitrogen oxides that can be harmful to human health, by worsening respiratory conditions. Both the UK Government and the Mayor of London are promoting the uptake of ultra-low emissions vehicles as a means of reducing pollution in cities and towns. Electric vehicles are one type of ultra-low emission vehicle and these are being promoted in London by the previous and current Mayor and Transport for London. An increasing number of Richmond residents have been requesting electric vehicle charging points near their homes in the borough.

Richmond has one of the largest potential take-up rates for electric vehicles in outer London, according to analysis by TfL. The absence of accessible charging facilities is a constraint on potential take-up and the air quality benefits it offers.

This strategy realises the latent and potential demand and addresses the concerns of EV users. Our vision is that, by 2026, Richmond's residents and businesses will be able to use electric vehicles every day and for any purpose. They will be confident that they will be able to recharge them quickly and conveniently, taking advantage of their lower cost operation and in doing so helping to improve air quality in the borough.

To realise our strategic objectives, we will:

- **Provide a network of fast chargers** for residential and commercial users
- **Provide a network of lamp column chargers** to supplement the above, in more constrained locations
- **Provide rapid charging hubs**, predominantly for commercial vehicles
- Investigate how to **meet the charging needs of car clubs** in the borough
- **Work with providers** to trial new technologies
- **Raise awareness of the EV market** so people can understand the options for and benefits of EV ownership

By 2026, we aim to have less polluting traffic on our roads, contributing to an improvement in air quality across the borough.

1. Introduction

1.0.1 The majority of vehicles on the streets of Richmond today run on either petrol or diesel fuel. However, the situation is changing, with a number of challenges to the predominance of this technology. Petrol and diesel are known to cause pollution, which is dangerous to public health and contributes to climate change.

1.0.2 For these reasons both vehicle manufacturers and other innovators are working to build interest in and use of alternative fuels. A desire to use these is growing in areas such as Richmond, with an increasing number of residents making enquiries about the availability of electric vehicle charging points and requesting the introduction of more points in the borough. These requests are expected to continue to rise in future, particularly as EV technology becomes more widely available and usage grows.

1.1 Policy context

National

1.1.1 The UK's Climate Change Act 2008 set out a long-term strategy for the UK's reduction of carbon dioxide (CO2) emissions. The Government subsequently set out its plan of action for greenhouse gas reduction in the Carbon Plan in December 2011. The plan identifies that transport has a critical role in meeting the Climate Change Act obligations. As the below sample of data in Richmond shows (Figure 1.1), emissions from road transport are by far the greatest land-based transport contributor to greenhouse gas emissions.

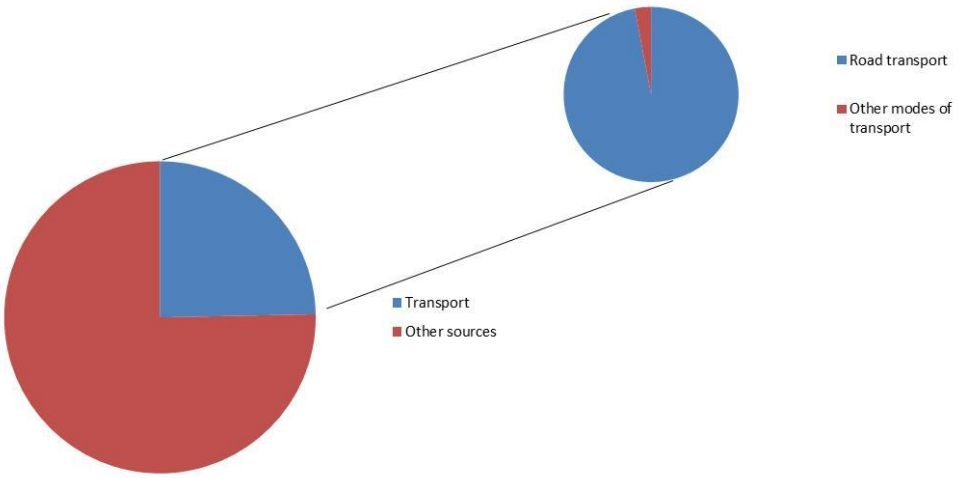


Figure 1.1: Carbon dioxide emissions in Richmond

1.1.2 The Government published 'Making the Connection: the Plugged-In Vehicle Infrastructure Strategy' during 2011. At the time of this strategy, the Government envisaged most EVs being recharged overnight, at homes or in vehicle depots. If such an approach was successful, this would have the benefit of balancing the demand for electricity across the day, increasing the energy savings offered by the uptake of EVs, while creating minimal infrastructure cost. Charging at work would be a second option for drivers. The strategy highlighted 'range anxiety', the concern about running out of battery while making a journey, as one of the key barriers to the uptake of EVs; a small number of public charge points were envisaged to be provided, primarily as top-up locations, preferably offered and funded privately.

1.1.3 In 2013, the Government published 'Driving the future today: a strategy for ultra-low emission vehicles in the UK', in which it said that its vision was for almost every car and van in the UK to be an ultra-low emission vehicle by 2050, with the UK at the forefront of their design, development and manufacture. In this the Government pledged to work with partners to achieve the switch to ultra-low emission vehicles, including expanding the provision of vehicle charging facilities beyond that envisaged in 2011.

Regional

1.1.4 The Mayor of London's Air Quality Strategy (2010) aims to reduce pollution in London, particularly the level of PM10s and nitrogen dioxide (NO2), both pollutants that can cause respiratory problems if people are overexposed to them. Policy 2 of the strategy promotes the transfer to and use of low emission vehicles – such as EVs - for private and freight transport, which is in line with the objectives of this strategy.

1.1.5 Transport for London launched the Ultra-Low Emission Vehicle Delivery Plan in July 2015. The action plan within the document focuses on, among other things:

- Gaining stakeholder support of EV charging networks to provide charging infrastructure;
- Increasing public awareness and acceptance of EVs;
- Offering attractive incentives to increase uptake of EVs;
- Supporting the demonstration and testing of new technologies and approaches (e.g. lamp column charging);
- Identifying priority charging and refuelling infrastructure locations, based on research and stakeholder insight;
- Working with car clubs to achieve a target of 50 per cent ULEVs in the London car club fleet by 2025;
- Deploying a rapid charge point network;
- Streamlining the ULEV and charging infrastructure procurement processes;
- Achieving zero emission capable taxis and PHVs on London's streets from 2018; and
- Increasing the uptake of ULEVs in freight and fleet organisations

1.1.6 TfL also commissioned a Plug-in Electric Vehicle Uptake and Infrastructure Impacts Study into the future uptake and impacts of EVs in 2015. This concluded that forecast demand for EVs would reach 10% of all vehicle purchases in the London Borough of Richmond by 2025.

Richmond

1.1.7 The whole borough was declared an Air Quality Management Area for NO2 and PM10 in 2000, and Richmond and Twickenham town centres are both Air Quality Focus Areas as defined by TfL.

1.1.8 Provision for electric vehicle charging is being incorporated into the revised policies within the Local Plan. The Council already requires developers to install electric vehicle charging facilities in new developments in line with the standards set out in the London Plan. The London Plan standards require 20% active provision (i.e. fully installed from the outset) plus 20% passive provision (i.e. cabling provided for easier future installation of charging equipment) in residential developments, and 10% active provision plus 10% passive provision in all other developments.

1.1.9 However, the current level of charging provision is too small to meet the projected level of demand; lacking coverage across the borough and being spread over several suppliers or schemes with little interoperability. Overnight charging is possible for residents living in homes with private off street parking, but a substantial number of the Richmond residents we expect to be interested in purchasing EVs live in areas without off-street parking. The number of houses in the borough without off-street parking means that an estimated 45% of electric vehicles will require on-street charging.

1.2 Technology

1.2.1 The UK has seen a surge in demand for ultra-low emission vehicles, including EVs, and 2015 saw a record year of sales with the strongest growth in London and the South East. ULEVs currently account for just over 1% of market share for new vehicles registered in London, but the pace of demand and ever changing technology means that by 2025 this is expected to have increased significantly. The majority of ULEVs are electric cars, and projections indicate that there will be around 100,000 ULEV cars on London roads by 2025.

1.2.2 These cars are broken down into three types:

- Battery Electric Vehicles (BEVs) – these rely solely on battery power and can travel between 100 and 300 miles on a single charge. Current examples seen on our roads include the Nissan Leaf, BMW i3 and the Tesla S saloon. 2015 saw a 48 per cent increase in pure electric registrations compared to 2014

- Plug-in Hybrid Electric Vehicle (PHEV) – these employ a conventional petrol or diesel engine alongside an electric motor. They have a relatively short range on electric power (20-40 miles) but the use of both motors can return figures in excess of 130 miles per gallon equivalent. Examples include the Mitsubishi Outlander SUV, the newer Toyota Prius PHEV and the BMW i8 sports car. 2015 saw a 137 per cent increase in plug in-hybrid registrations compared to 2014.

- Hydrogen Fuel Cell Electric Vehicles (FCEV) – still currently at a development stage with limited production due to the difficulties of hydrogen production, storage and refuelling. A charging station is open at the National Physical Laboratory in Teddington with around 50 or so FCEVs in London. As no charging is needed, these are not being considered as part of this document but will be a future factor in ULEV uptake in the borough.

1.2.3 There are currently three power levels associated with EV charging. These are:

- 3kw: this is the oldest standard and can typically be supplied by a standard household 3-pin plug or via a street light charging point. A typical full charge of an electric vehicle takes between 7 and 8 hours, meaning that it is most suited for overnight charging at or near home or work, and the number of users in a 24 hour period is low (typically 1 – 2). The two existing borough-owned Elektrobay points are 3kw units.

- 7kw: a newer standard that requires a dedicated power source and connecting cable type. A typical full charge on an electric vehicle takes 3-4 hours, meaning that 3 or 4 users a day could fully charge. This supply is becoming common in

many current on-street or public car park charging points, as well as in supermarkets and businesses.

- 22 – 50kw (rapid): a high power rapid charging option to suit the needs of users who need to charge their electric vehicle quickly to keep them in use, such as taxis, commercial vehicles or company cars. A full charge typically takes 30-40 minutes, allowing for a high number of charges per day. Rapid points are now available at most motorway service stations and are being planned by TfL as part of their own network. Although smaller designs are becoming available, these units are relatively large compared to lower power units and require significant local power network capacity, so are more suited to off street provision.

LBRuT 3kw charging point


Source London 7kw

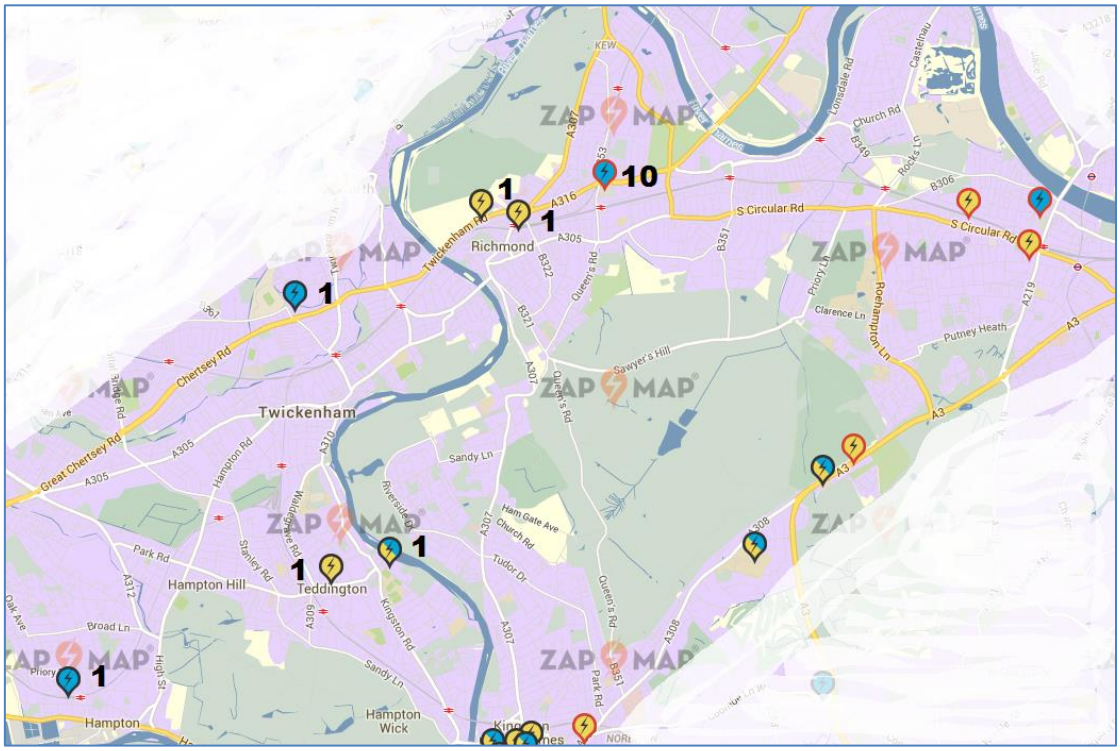

New-style rapid charger

Figure 1.2: Examples of charging point technology in the UK

2. Challenges and Opportunities

2.1 Current situation in the borough

2.1.1 At present there are 16 charging points for EV owners/users across the borough, as shown on the map and table below (Figure 2.1). In addition to these points there are several borough residents with home charging stations who rent out their driveways to commuters or visitors, via websites such as Parkopedia or ZapMap.



No of points	Access	Supplier	Location	Charge Speed	Cost
1	Public Council	Elektromotive	Cedar Road Car Park, Teddington	3KW	Free but parking charges apply
1	Public Council	Elektromotive	Old Deer Public Car Park, Richmond	3KW	Free but parking charges apply
1	Customer	Source London/ Chargemaster POLAR	Richmond Station Car Park (NCP)	3KW	Free but parking charges apply
10	Customer	Pod Point	Sainsburys Car Park Richmond	7KW	Free with RFID card £12.50/yr
1	Customer	Source London/ Chargemaster POLAR	Waitrose, Oldfield Road Hampton	7KW/ 4KW	Free with RFID card £5/yr
1	Private	Source London/ Chargemaster POLAR	Currie Motors Twickenham	7KW	Free with RFID card £5/yr
1	Private	Chargemaster POLAR	Teddington Studios Broom Road	3KW/ 7KW	Chargemaster subscription

Figure 2.1: Charging point locations in Richmond, December 2016 (map courtesy of zapmap.com)

2.1.2 The Council owns the two Elektrobay charge points in Old Deer Park and Cedar Road. These are now very old and unreliable, and the manufacturer Elektromotive have now run out of the old-style key fobs issued to access them. There are currently 44 members of the scheme, of whom 37 live in the borough. There is no detailed usage data of these points because the technology is too old for it to record data automatically. Monitoring is limited to the occasional electricity bill for each unit. The lack of self-reporting means that when a fault develops, or a cable gets stuck in the charger, it can be some days before it is reported, and an engineer sent to rectify the problem. These points are therefore in need of replacement.

2.2 Projected growth in demand for EVs in Richmond

2.2.1 To understand likely growth in the longer term, in 2015 TfL commissioned a Plug-in Electric Vehicle Uptake and Infrastructure Impacts Study into the future uptake of EVs. The objectives were as follows:

- Map where EV uptake is most likely to occur across London for cars, vans, powered two wheelers and taxis
- Map the energy and power demand from EVs across London, to inform the London Energy Plan
- Understand the infrastructure demand and impacts

2.2.2 Mapping was undertaken by Medium Level Super Output Area (MSOA) using data supplied by the National Statistics Service. Each MSOA is generated automatically by zone-design software using census data. They have a minimum size of 5,000 residents and 2,000 households with an average population size of 7,500. They fit within local authority boundaries. There are 983 MSOAs in London, of which 23 are in LBRuT.

2.2.3 Two uptake scenarios were used for the study, both representing an ambitious level of ULEV uptake. In both scenarios, ULEVs represent 100 per cent of sales by 2050, as per the Committee on Climate Change (CCC) projections. The projections are shown in the table in Figure 2.2.

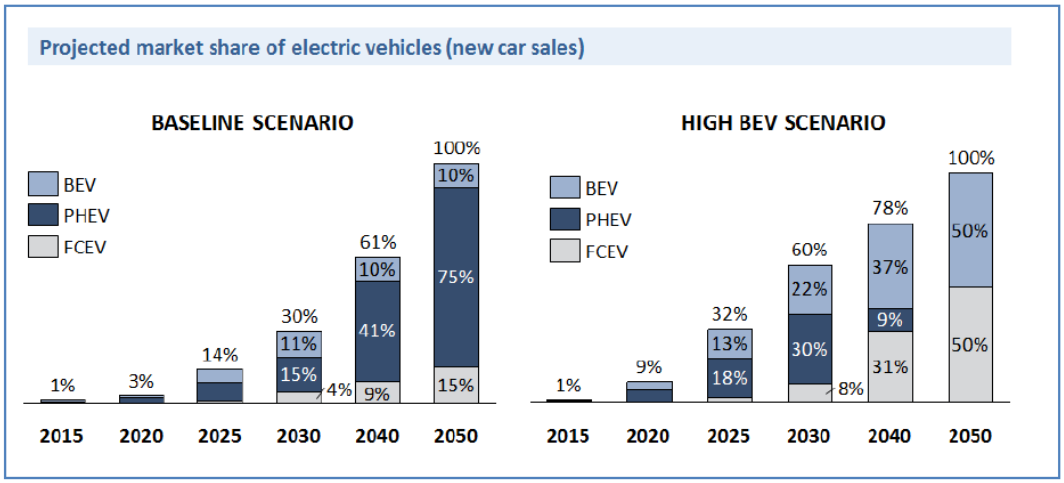


Figure 2.2: Baseline and high uptake scenarios (TfL)

2.2.4 The study found that Richmond currently has an EV share of between 1:351 and 1:500 of total car sales, and 1:501 to 1:2000 of total van sales.

2.2.5 The study used the factors and weighting in Figure 2.3 below to predict the level of EV uptake in the future.

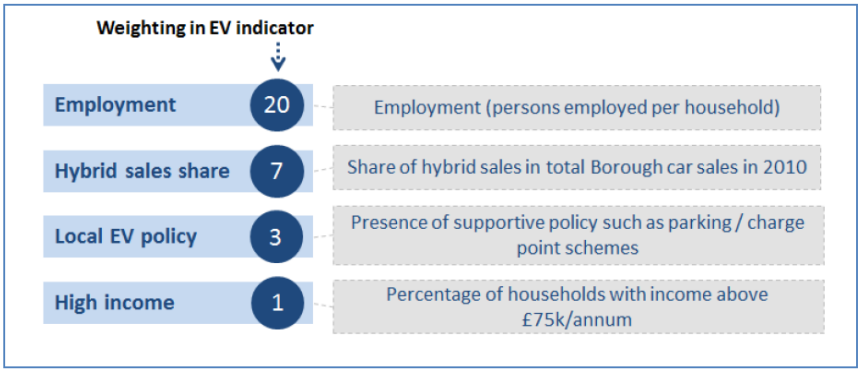


Figure 2.3: Factors and weighting used to predict level of EV uptake

2.2.6 Using this methodology to predict the percentage of EV car sales 2014-2015 across London, Richmond showed a higher percentage uptake compared to other boroughs. With levels of employment and average incomes among the highest in London, the predicted distribution of EV stock in 2020 and 2025 by Medium Level Super Output Area (MSOA) showed that LBRuT would have one of the highest levels of EV stock in London in 2020 and 2025, for both the baseline and high level scenarios, as shown in Figure 2.4.

	Baseline			High Scenario		
	2015	2020	2025	2015	2020	2025
Total EVs in LBRuT	276	1716	7372	276	3872	11839

Figure 2.4: Predicted uptake in Richmond

2.2.7 When compared against our neighbours we can see that Richmond is predicted to have the highest EV numbers in South West London, as seen in Figures 2.5 -2.8.

2.2.8 The 2011 Census showed that approximately 83,000 cars were owned by borough residents. To put this in context, using the projections above, it can be estimated that by 2025 some 7-12,000 of these could be EVs – potentially up to 10% of all vehicles. In addition increases are likely to be seen in neighbouring boroughs as well as additional vehicles belonging to commuters and visitors.

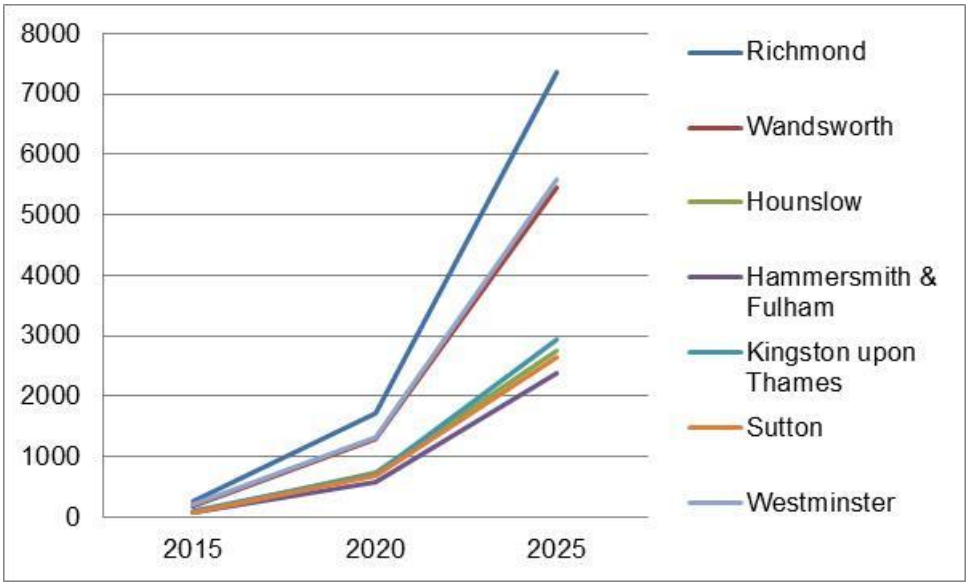


Figure 2.5: Baseline TfL Scenario

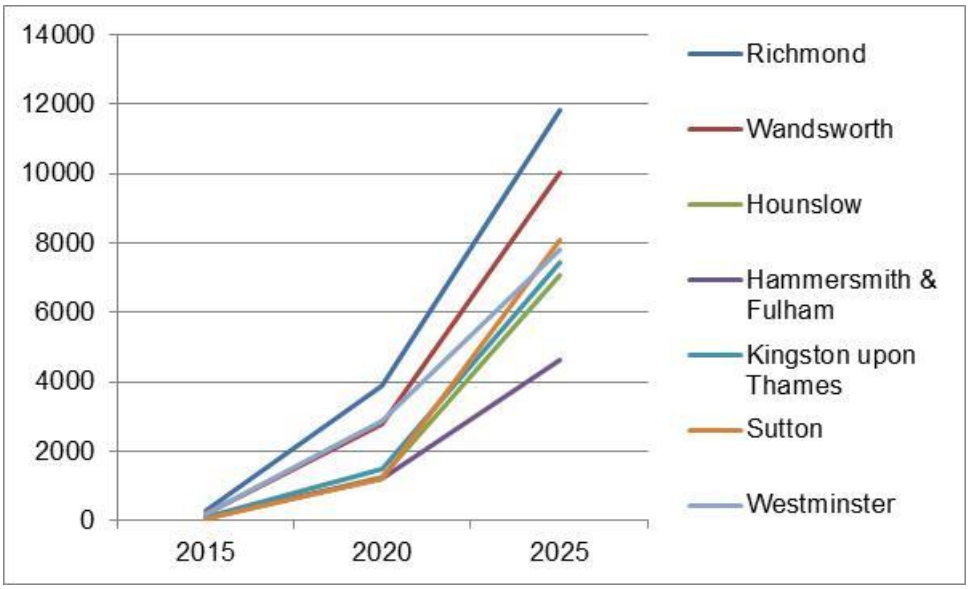


Figure 2.6: High uptake TfL Scenario

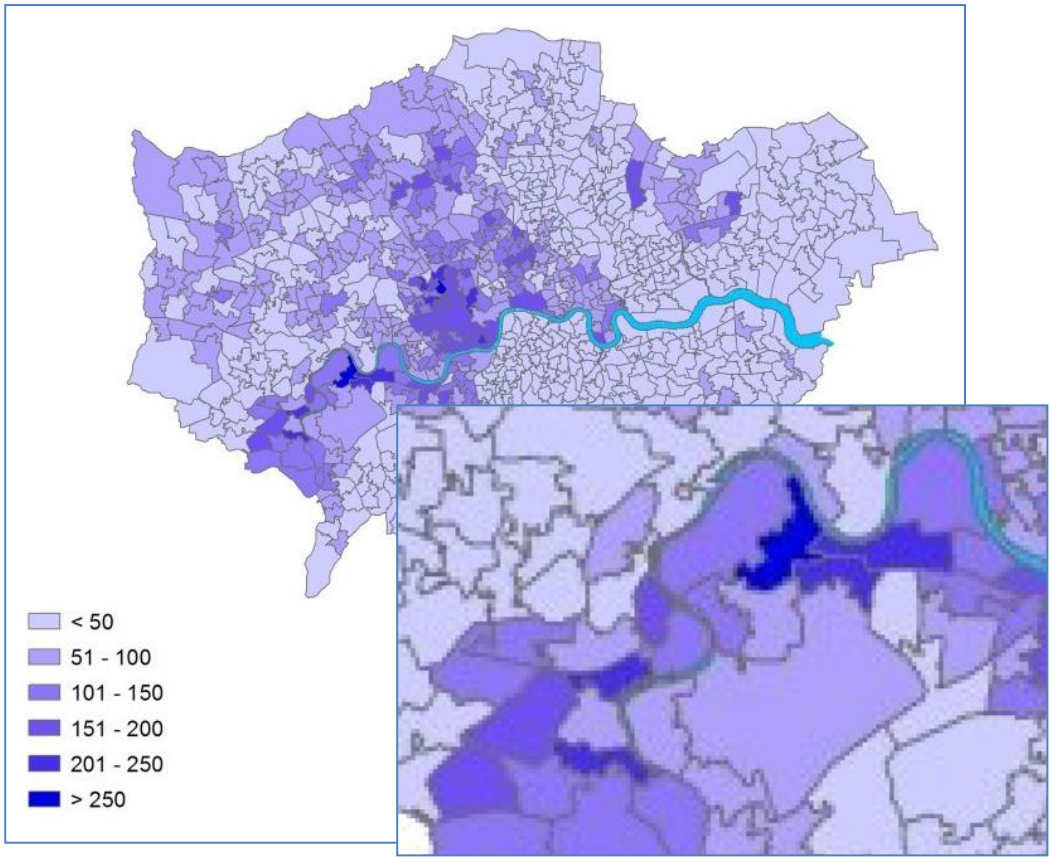


Figure 2.7: Distribution of EV stock per MSOA, baseline scenario 2025 (EE & WSP PB for TfL)

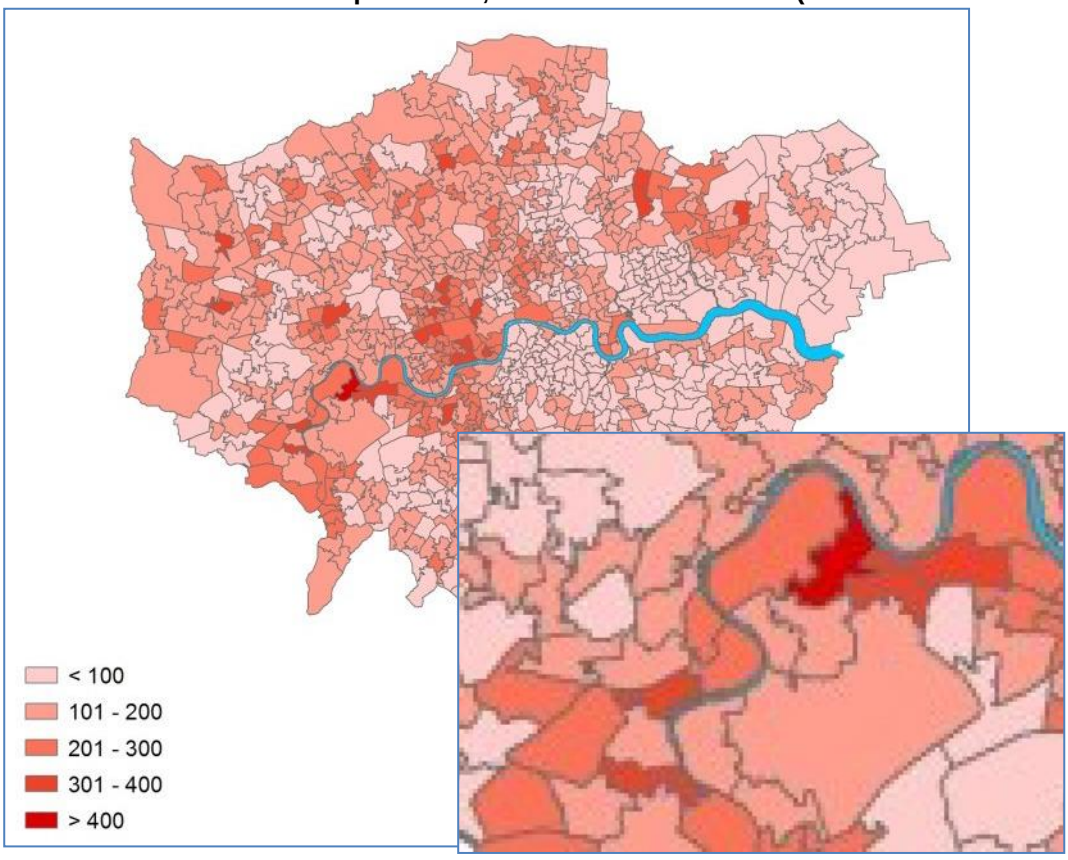


Figure 2.8: Distribution of EV stock per MSOA, high scenario for 2025 (EE & WSP PB for TfL)

2.3 Reaching the 'tipping point' for EV sales in Richmond

2.3.1 The study found that currently Richmond currently has an EV share of less than 1% of total car sales and under 0.5% of total van sales. This is at level comparable with the rest of London. Between December 2015 and January 2016 Populus interviewed over 1100 EV owners in London. They found that:

- Most users are between 40 and 49 years old (29%) with the second highest age bracket being between 30 and 39 years old (24%)
- Most users are male
- The average annual income of a user is £66,000
- The highest barrier to using an EV is the lack of charging points

2.3.2 Figure 2.9 shows where the London market currently is on the EV growth trajectory.

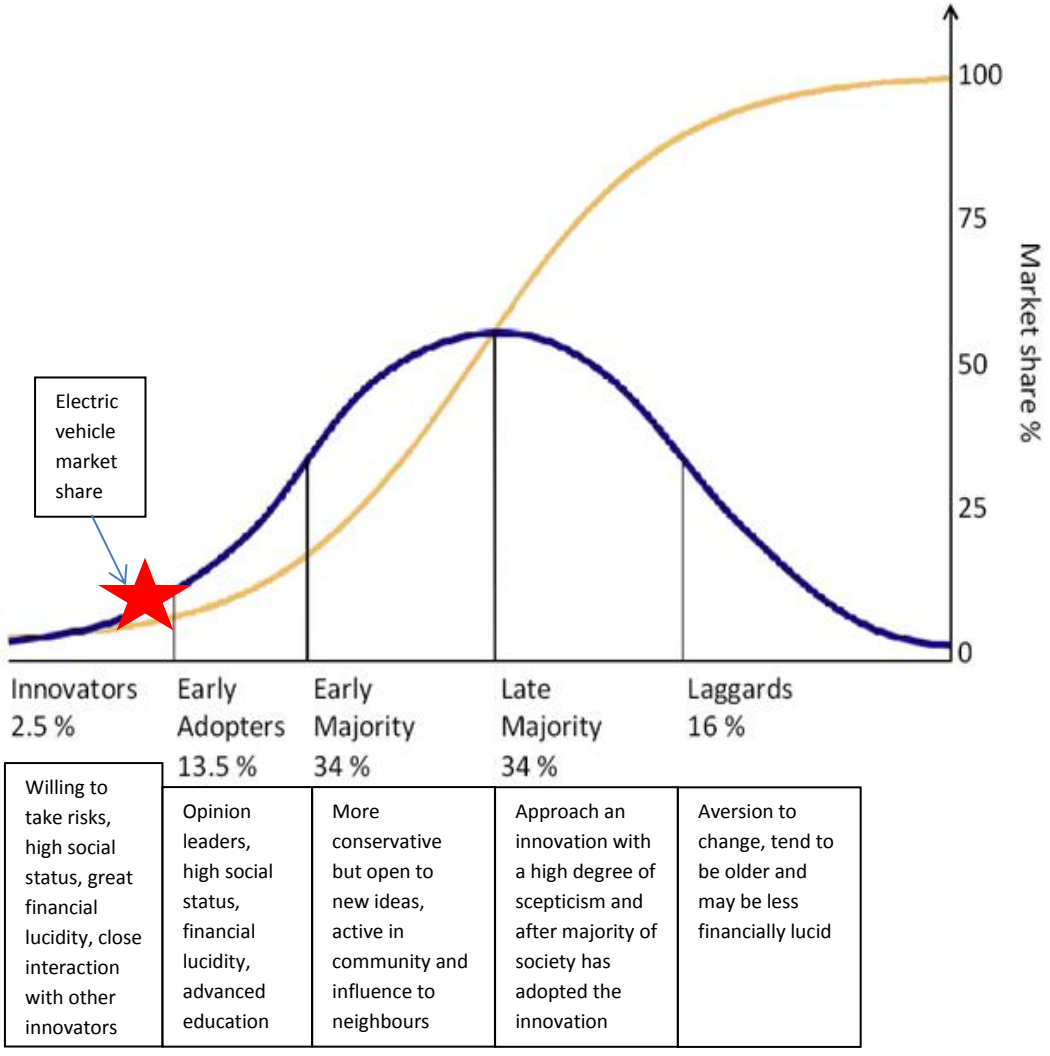


Figure 2.9: The London EV market development stage

2.3.4 The most critical factor in encouraging EV take-up in the borough is the network size, speed and availability of suitable charging points. Too few options will stunt the

growth of EV ownership and usage by residents, discourage visitors, and potentially impact on local businesses. Too many and there will be an issue with spaces left empty for long periods of the day and constraints on parking.

2.3.5 Due to the low level of existing on-street provision, it can be assumed that in 2016 the majority of existing EV owners in the borough have access to off-street charging at home or work or make use of the other options set out in Figure 2.1. Looking forward to 2020 and beyond, in order to support further uptake a greater percentage of EV buyers will need access to on-street charging. With an estimated 45% of households in the borough with no off-street parking, and an estimated 1716 EVs in the borough by 2020, this suggests a theoretical maximum of 773 residents who would require some form of on-street charging facility at that time. While this is not a firm figure it gives a realistic assumption to work to.

2.4 Usage and charging speed

2.4.1 As with any vehicle, usage will vary according to journey purpose and lifestyle, so not all EV owners will need to charge every day. With a mixture of short journeys typical in a London borough, and EV ranges varying between 120 and 300 miles depending on the size and battery capacity, some users may only need to charge once or twice a week, while others will need to either fully charge overnight or top up on a more frequent basis.

2.4.2 As noted in the charger types section above, the slow 3kw chargers can realistically accommodate no more than 2 full charges within a 24 hour period, whereas the faster 7kw and 22kw chargers could accommodate between 4 -6 full charges in that time. 50kw rapid units have a theoretical maximum of 36-48 charges a day, although in practice this is more likely to be 12-15 given that overnight usage will be light and some vehicles will take longer than others. Each charge point should therefore be able to accommodate a number of users in the course of a day or week.

2.4.3 Some chargers are likely to be more popular than others in the early stages, and this will help shape the ongoing rollout of additional chargers in those locations. As usage builds, the demand for chargers is likely to expand, with the need to keep apace of this demand.

2.5 Other challenges in providing charging points

2.5.1 There are a number of other challenges that need to be overcome in order to provide new charging points in the borough:

- Controlled Parking Zones – use of a CPZ does not grant the user any automatic right to park outside their own home, and aside from bays for disabled drivers the Council does not at present reserve separate bays for individuals. When providing charging infrastructure within a CPZ the bays will need to be clearly marked as ‘EV only’ to allow scheme users to access the charging points. It is likely that most will be at the start or end of a CPZ bay.

- Location of equipment – Many residential pavements are narrow and are subject to existing numbers of streetlights, signposts and telecom cabinets. Any installations will need to allow sufficient footway clearances. Options to overcome

these issues include using charging points mounted on street light columns where these are at the kerbside or, where additional verges or wider pavements permit, a series of kerbside posts.

- Utilities (gas, electric, telecom) cables and pipes tend to be located either under the pavement or close to the edge of the carriageway, which may preclude installation of new pillars in some locations.

- Heritage or Conservation areas – in these areas the colour and type of street furniture used is subject to scrutiny.

- Power requirements - The primary usage in residential areas is expected to be overnight and therefore the need for more powerful rapid charging facilities is low (see 'Charger Types' above). As such this type of charging might well be delivered through a combination of 7kw pillars and 3kw street light-mounted charging points. In locations closer to retail areas, usage is likely to be more consistent through the day and night. In determining precise locations for all types of charger, the power capacity of the local network will be a significant consideration, and this will need to be assessed with UK Power Networks as part of the survey process prior to installation. UKPN will also require all charging infrastructure to be licenced for use. All electricity cost should be met by the operator or user and will not be subsidised by the Council.

3. Vision, Objectives and Actions

3.1 Vision

Richmond's residents and businesses will be able to use electric vehicles every day and for any purpose. They will be confident that they will be able to recharge them quickly and conveniently, taking advantage of their lower cost operation and in doing so helping improve air quality.

3.2 Strategic Objectives

1. To facilitate EV ownership and use amongst the following user groups through an expanded charging network across the borough:
    - Residents
    - Businesses and their suppliers
    - Car club operators
    - Taxi and private hire fleets
2. To provide a range of types of charging point to meet the needs of different user groups
3. To continue to trial new technologies as they evolve to ensure that charging infrastructure keeps pace with vehicle technology and the needs of residents and businesses
4. To require private developers and landowners to provide EV charging on their sites
5. To raise awareness of the benefits of EVs and the charging infrastructure that is available

3.3 Summary of Actions

1. Provide a network of faster chargers for both residential and commercial users
2. Provide a network of lamp column chargers to supplement the above, in more constrained locations
3. Provide a number of rapid charging points, predominantly for commercial vehicles
4. Investigate how best to meet the charging needs of car clubs in the borough
5. Work with providers to trial new technologies and work with TfL and operators to achieve interoperability between systems
6. Raising awareness of the EV market so people can understand options for EV ownership

3.4 Details of actions

Action 1 - Provide a network of faster chargers

- At present, 73% of all EV users charge at home and 62% also charge in public, with the majority of these using on-street facilities at least once a week. However, in areas identified as of potential high future demand, such as North Sheen, East Sheen and Twickenham, between 51%-60% of homes are without off-street parking. A high proportion of new users in these areas will require on-street facilities much more frequently than expected to be the case with current EV users. In areas of high future demand such as Richmond, Hampton, Teddington and Barnes, a lower level of homes are without a driveway (between 31%-40%), but this will still mean a growth in demand for on-street facilities. We expect that up to 800 residents would require some form of on-street charging facility by 2020. While this is not a firm figure it gives a realistic assumption to work to.

- The network of on-street charging facilities is limited in the borough. Those provided by the borough are ageing and low-power, 3kw devices. However, the Council is aiming to rapidly roll out a substantial network of faster, 7kw charge points suitable for borough residents, visitors and other owners of EVs.

- The table in Figure 3.1 sets out a proposed expansion strategy for on street fast chargers. Each site will have at least three charging points, with capacity to expand to five points per site if future demand warrants this. These figures will be regularly reviewed to assess usage to date and re-evaluate future predicted growth.

Year	Target number of fast charger sites
2016/17	20
2017/18	25
2018/19	35
2019/20	40
2020/21	50
2021/22	55
2022/23	60
2023/24	70
2024/25	75
2025/26	80

Figure 3.1: Expansion strategy for on-street fast charging points

- The proposed locations for installation by the end of 2017 are shown as blue dots in Figure 3.2. This map also shows where residents have requested EV charging points. There are 24 proposed sites in total, which includes three locations in Council car parks (Old Deer Car Park, York House Car Park and Cedar Road Car Park). The existing points in Old Deer Car Park and Cedar Road Car Park will be replaced. Each of the on-highway sites will require Traffic Regulation Orders in order to proceed, which are subject to consultation with local residents and businesses in the vicinity.

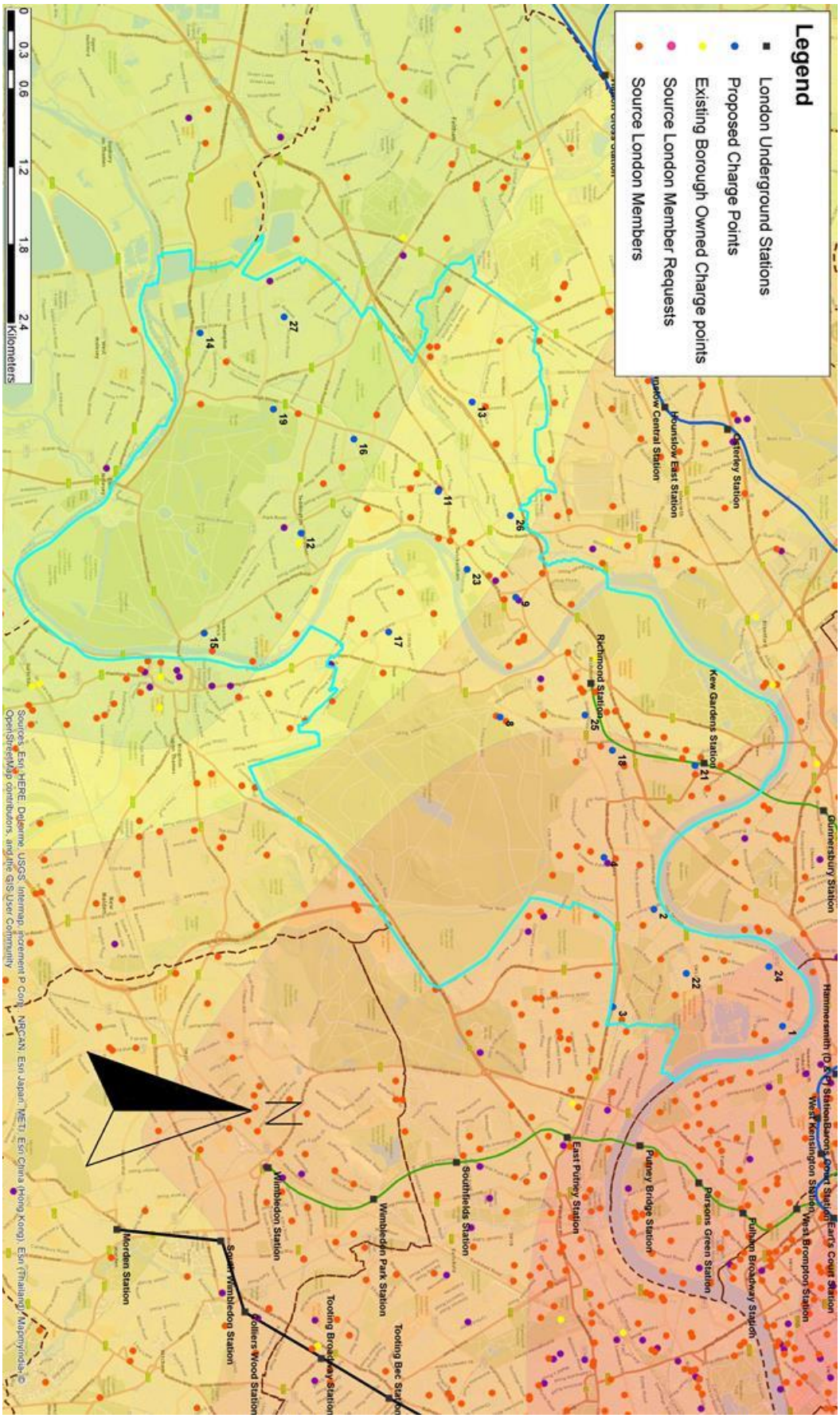


Figure 3.2 – Map showing proposed charging points and borough requests

- Locations have been chosen to achieve an even spread of charging points across the borough, taking into account resident requests that have been received. Many of the sites in the first phase have been located in locations near retail areas to help raise awareness of the new network and encourage EV uptake. However, further phases are likely to be in more residential areas. A number of criteria apply to the sites to overcome the challenges set out in Section 1 of this strategy (such as minimum footway clearances, distance from existing utilities etc.

- The Borough has undertaken an analysis of the offers available from different EV point providers/operators, and has concluded that a company called Bluepoint potentially offers one of the best and most cost effective solutions for the borough. Bluepoint are providing and running electric charging points for a growing number of other boroughs, with TfL and 14 other boroughs signed-up to the scheme, including Wandsworth. The scheme has been launched in the other boroughs under the terms of TfL's existing Partnership Agreement with Bluepoint, subject to a Supplementary Agreement with each borough. Given that the Council is effectively extending TfL's pan London EV charging scheme that has already undergone a competitive tendering process for management and operation, a new competitive tendering process by the Borough is not considered necessary. Capital costs for providing the scheme, including the provision, installation and maintenance of the charging points, will not fall upon the Borough. Bluepoint will also bear the cost of the electricity used by the charging points. The borough will be looking to sign a contract with Bluepoint for the roll out of the first phase of on-street fast chargers, subject to officers agreeing the detailed content of the legal agreement.

Action 2 - Provide a network of lamp column chargers

- Residents who are potential EV drivers may also need other, more convenient forms of charging in addition to the fast charging network. Some residents may request the borough install charging devices closer to their homes. A number of operators are developing EV charging systems that enable charging points to be installed onto existing lamp columns. These tend to be slower-charging, 3kw devices, which allow vehicles to be charged overnight. It should be noted that lamp column chargers can only be fitted to lamp columns located at the kerb side to avoid cables being trailed across the footway.

- LB Hounslow have trialled such a scheme with Ubitricity and installed two prototype 3.5kw sockets as a retrofit on existing street lights. The borough is currently exploring similar systems with other providers, with a view to trialling this technology in Richmond. However, there are currently a number of legal, regulatory, funding and parking questions regarding this type of EV charging which need to be addressed prior to roll out.

Action 3 -Rapid Charging Points for commercial vehicles

Taxis and Private Hire Vehicles

- From 1 January 2018, all taxis licensed for the first time must be zero emission capable (ZEC). For Private Hire Vehicles (PHVs) the requirements are staggered,

with the ZEC requirement for all new PHVs presented for licensing being applied from 2020. Regardless of age, all vehicles granted a private hire licence for the first time after 1 January 2023 will be zero emission capable. These vehicles are in use for long periods and so require high-speed charging facilities in strategic or central locations that are convenient for railway stations, town centres and the main highway network.

- The growth of the PHV market seems to be moving more towards the use of freelance drivers who may be able to meet much of their charging demands at home. Nonetheless, they are still likely to rely to some extent on the ability to be able to rapidly charge their vehicles if necessary during the day. Other than taxi ranks at stations and key centres, there is little data available on where cab drivers park or take breaks, and this will also be a critical issue in site selection. This may require some surveys amongst licenced drivers and cab companies.

Light Commercial Vehicles (LCVs)

- Light Commercial Vehicles (or vans) have grown in use (measured in miles) across London over the last decade. This may be because of the growing service economy in London, including an increase in demand for deliveries to homes as a result of Internet shopping. The energy use and therefore demand for charging per LCV is substantial, because an LCV tends to be in constant use throughout the week. Some EV LCVs will normally return to a private depot for charging after use by employees during their shifts, rather than charge elsewhere, but there is likely to be some potential demand for rapid charging facilities to enable drivers to charge vehicles while at work, where necessary. Finally, some car drivers in small-medium enterprises (SMEs) will require the ability to rapidly charge their cars, for example if their occupation involves driving between many different destinations each day.

Provision of Rapid Charging Points

- Considering the demand for rapid charging from a variety of markets, there is a need for the Council to work with TfL to investigate options for some off-street rapid charging facilities in areas of high anticipated demand, in addition to our standard fast charging network. Due to the current size of rapid chargers it is not envisaged that these can be accommodated on street. Emerging technologies are potentially capable of a single rapid charger unit being able to charge six vehicles simultaneously. Potential locations currently being explored with TfL are:
    - Old Deer Park / car park, Richmond
    - Sheen Centre car park, East Sheen
    - Twickenham town centre car parks

- Alternative locations could potentially be on private land and shared between commercial and public use at different times of the day.

Action 4 – Meeting the needs of car clubs

- Residents and small businesses are also served by car clubs in the borough. Two car clubs currently operate in the borough, using fleets of conventional petrol and diesel cars as well as vans. Zipcar and Enterprise Car Club (formerly City Car Club) operate from 71 designated on-street car club bays across the borough. A number of new operators have come to the market to offer free

floating, bay-free car clubs, for example Drive Now and Bluepoint. This is where car clubs vehicles can be parked in any bay, and once hired do not need to be returned to the same bay from which they were picked up. The suitability of this model for Richmond will be considered as part of a separate Richmond Car Club Strategy.

- At the moment, due to the lack of infrastructure in the borough no operator has brought forward detailed proposals for deploying EVs in their local fleets, although both have said that if infrastructure was provided they would seek to convert a certain percentage of their fleet to EVs.

- Under the Mayors Electric Vehicle Delivery Plan, car clubs are required to contribute to the target of achieving 50 per cent ULEVs in the London car club fleet by 2025. The Council therefore needs to consider what proportion of the existing car club bays are capable of being equipped with a charging point, and to work with providers to identify what their plans are.

- Depending on the Council's discussions with the two operators it may be possible to locate resident charging bays alongside car club bays in order to economise on the infrastructure needed. There is a possibility that TfL / OLEV will fund the provision of EV points in car club bays.

- An alternative solution for charging car club vehicles, particularly those that operate under a free floating model, may be mobile rapid charging solutions. This is where a rapid charger is housing within a van, which travels to the location where the car club vehicle is parked to rapidly charge it. This could be a solution for fixed car club bays where there is insufficient footway width to accommodate the charger or if in future free floating car clubs are operating within the borough.

Action 5 – Work with providers to trial new technologies and work with TfL and operators to achieve interoperability between systems

- The EV market is likely to develop rapidly and innovations are likely to be brought forward at an increasing rate. These will include different charging technologies, which can improve the convenience, efficiency and speed of charging, while mitigating the risk to the electricity network from peaks in demand. The Council will work with providers to develop the new technologies and trial them on street.

- In order to ensure ease of use for drivers, systems must be interoperable. In particular, the same access and payment methods must work between providers across all the new EV technologies. The Council will work with Transport for London to ensure that this is achieved.

Action 6 - Raising awareness of the EV market

- Potential EV owners need to feel confident that using an EV will be easy. A number of national websites already exist which are aimed at established EV users, for example zapmap.com. However, the borough's EV web pages need upgrading and can be developed into a website dedicated to EV users in Richmond. This can offer bespoke advice and can link with local businesses, for information and to provide special offers for EV users. Related to this, EV users

in areas or in the borough as a whole may be able to communicate with each other and develop local proposals for suggestion to the borough and other partners. In this way, raising awareness of the EV market via websites and other channels can act as a two-way channel.

3.5 Funding of infrastructure

3.5.1 Depending on the type of charging point, the initial cost of purchase, installation and maintenance of the points are likely to be substantial, as well as the statutory order costs for equipment siting, bay designation and enforcement. The Council's view is that as much of this as possible should be met by the scheme operator and that the Council should not be subsidising scheme membership or electricity costs for EV users. The Council will therefore seek to minimise its costs for procuring the charging point network, and will consider a wide range of potential funding sources. These may include:

- Private partners and other commercial deals e.g. Bluepoint London
- Mayor's Air Quality Funding (future rounds)
- Office for Low Emission Vehicles (OLEV) grant funds – this is currently under review by OLEV;
- TfL Local Implementation Plan funding
- Development levies such as section 106 funding or Community Infrastructure Levy

4. Targets and Monitoring

4.1.1 The monitoring plan in this chapter sets out how the Council will keep track of the delivery of its overall strategy vision, objectives and actions, with annual reports to be compiled.

High level targets				
Target	**Measurement**	**Baseline**	**Target**	**Linked to which objective**
Expansion of charging network	Number of charging point locations	2 locations in 2016	At least 80 locations by 2026 (i.e. at least 240 individual charging points)	All
EV ownership amongst residents	Number of residents who are members of EV charging schemes in the borough	Current number of members of Electromotive scheme: 37	Increase membership levels to at least 500 by 2026	1
Business take-up of EVs (including taxis)	Number of businesses who are members of EV charging schemes in the borough	0	Increase membership levels to 100 by 2026.	2
Conversion of car-club operators to EV	% of vehicles EV	0	All car club vehicles to be EV or ULEV by 2026	2

4.2 Delivery indicators

Annual delivery indicators		
Indicator	**Measurement**	**Linked to which objective**
Number of charging points implemented (broken down by type)	Council data	All
Air quality improvements	Reduction in PM10s and NOx across the borough	All
Number of charging points provided in new developments	Council planning data	6