

Annex 1	RBK ULEV Context, Policy and Action Plan
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About this report

This paper provides information about ultra-low emission vehicles (ULEVs) in Kingston and proposes adoption of an ULEV policy.

The report objectives include the following:

- Understand existing operation and current demand
- Provide for future uptake based on research undertaken by TfL and strategic objectives (national, London-wide and borough level)
- Relate the different types of charge points to the different types of use
- Develop guidelines and a potential implementation plan to guide the roll-out of ULEVs
- Provide recommendations on how to facilitate the take-up of ULEVs in the borough.

Context

The Mayor of London's Transport Strategy aims to make London's transport network zero emission by 2050.

The strategy notes that even with higher levels of walking, cycling and public transport use – motorised vehicles will remain a feature of London's streets.

This means that there is a need for strong policies that will encourage these vehicles to be as clean and energy efficient as possible.

In addition, the Government intends to ban the sale of non-hybrid petrol and diesel cars by 2040.

As a result, ultra-low emission vehicles (ULEVs) will be important in reducing reliance on petrol and diesel. They include the following:

- Battery electric vehicles (BEVs)
- Plug-in hybrid vehicles (PHEVs)
- Range-extended electric vehicles (RE-EVs), and
- Hydrogen fuel cell electric vehicles (FCEVs).

Kingston currently has no alternative fuels policy and needs one to guide decisions. Such a policy would support the Council's draft Sustainable Transport Strategy which forms part of our third Local Implementation Plan (LIP3) submission.

Supporting the ULEV Delivery Plan for London

The ULEV Delivery Plan for London developed by Transport for London (TfL) identifies a number of actions.

This piece of work aims to support the following actions:

- Support stakeholders' aspirations for expanding Source London
- Identify priority charging and refuelling infrastructure locations, based on research and stakeholder insight
- Work with car clubs to achieve a target of 50 per cent ULEVs in the London car club fleet by 2025
- Increase public awareness and acceptance of ULEVs
- Deploy a rapid charge point network
- Provide charging solutions for residents without off-street parking
- Ensure London is ready for the commercialisation of hydrogen transport.

Core themes

Based on TfL's research, core themes have emerged which have been used to guide the development of this paper:

- Identify current demand
- Provide for future uptake
- The right charge point in the right place

Each of the core themes is described in further detail throughout this paper.

Battery electric vehicles

100% pure or battery electric vehicles are powered by a battery which drives the electric motor. Though particulates are released from their brakes and tyres, they have no exhaust emissions. Battery electric vehicles typically have a range of around 80 miles but some can achieve up to 300 miles.

Plug-in hybrid vehicles & Range-extended electric vehicles

Plug-in hybrid and range-extended electric vehicles also have a conventional diesel or petrol engine, meaning they usually have a longer range than with a battery alone.

Hydrogen fuel cell electric vehicles

Hydrogen fuel cell electric vehicles have a fuel cell which uses hydrogen to produce electricity which powers the wheels of the vehicle. They typically have a range of around 300 miles.

Current EV charging provision and demand

Council-Provided charging points

There are 10 charging points located on RBKingston roads and in its off-street carparks. These were provided several years ago through the Source London network, which has since been taken over by BluePointLondon (BPL), a subsidiary of the Bolloré Group. There are charges (set and collected by BPL) for using these points. The existing locations and charging speeds available are as follows:

Cattle Market Car Park (Basement)

- One charging point (slow)

The Bittoms Car Park

- One charging point (slow)

The Rose Car Park

- Two charging points (slow)

Blagdon Road Multi-Storey Car Park

- One charging point (slow)

Hook Centre Car Park

- One charging point (slow and fast)

Union Street

- One charging point (slow and fast)

Claremont Street

- One charging point (slow)

Bridge Street

- One charging point (slow and fast)

Fairfield Road

- One charging point (slow and fast)

St Mark's Hill

- One charging point (slow and fast, pictured below)



The cost to the user of charging at a Source London point can be higher than on privately provided sites which are often subsidised by the landowner.

The charge to customers is priced by Bluepoint to include both capital costs and running costs as well as the benefit of being able to book a session ahead of time.

Non-Council provided (publicly accessible)

There is a growing number of non-council provided, publicly accessible charging points, located throughout the borough and locatable at zap-map.com

As of November 2018 these points are at:

- Ace Parade KT9 1DS
- Asda Kingston (pictured below)



- Bentall Centre - Car Park KT1 1TY
- Currie Motors Kingston SW20 0AD
- Chessington World Of Adventures
- KT9 2NE
- Kingston University - Kingston Hill Campus KT1 7LB
- Kingston University - Knights Park Campus KT1 2QJ
- Kingston University - Penrhyn Road Campus KT1 2EE
- NCP Fairfield KT1 2PR
- NCP St James Road KT1 2BA
- Seven Kings Car Park KT2 5AF
- Shy Horse KT9 2NQ
- Tolworth Hospital KT6 7QU
- Tolworth Sports Ground KT4 7QH
- Waitrose Surbiton KT6 4QR

Non-Council provided (private)

The National Planning Policy Framework (both 2012 and 2018) directs that applications for development should enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations. It directs councils when setting local parking standards for residential and non-residential development to take into account the need to ensure an adequate provision of spaces for charging plug-in and other ultra-low emission vehicles.

The current London Plan requires that 20% of all spaces must be for electric vehicles with an additional 20% passive provision (ie power supply available for additional charge points to be installed and connected to in the future as demand increases).

Page 36 of RBK's Sustainable Transport SPD echos the requirements of the London Plan, with additional information for businesses.

The new plan is moving towards a requirement for 100% passive provision in new developments.

As a result, large private developments and workplaces are providing charging points across the borough – however this is not yet mapped in one location.

ACTION: Map existing ULEV charging points based on approved development conditions to better understand private provision of charging points. This would be subject to Council resourcing and/or bid funding availability

Slow chargers

Slow chargers (up to 3kW) are best for overnight charging and usually take between 6 and 12 hours for a pure-EV, or 2-4 hours for a PHEV.

Fast chargers

Fast chargers cover those with 7kW and 22kW power outputs, which typically charge an EV in 3-4 hours.

Rapid chargers

Rapid chargers are divided in two sections – AC and DC. Currently available Rapid AC chargers are rated at 43kW, while Rapid DC are typically 50kW. Both will charge an EV to 80% in around 30 minutes.

There are two different main connector types for Rapid DC chargers – CCS and CHAdeMO – though additionally, Tesla Superchargers are also Rapid DC and currently charge at around 120kW.

Current ULEV charging point usage

At present we do not have access to data on charging point usage (number of charges, number of clients, total charge time). BPL cannot provide current ULEV charging point usage information as the points are not part of their network.

Instead they are being maintained by the original suppliers of the equipment through the original Source London contract, Elektromotive in our car parks and Chargemaster on street.

The council has approached Chargemaster and Elektromotive for this data and we await a response.

ACTION: Follow up this request to current suppliers for usage data.

Not all Source London members can access these old-style chargers and accordingly not all of them are promoted through Zapmap. Once RBK fully novate the Source London contract to them BPL will investigate whether RBK's ten existing Source London sites comply with current Institute of Engineering and Technology guidelines.

BPL would then look to upgrade them in their current location or in new locations following this Policy. BPL would consider visibility and demand when assessing feasibility of sites. Any move of location would be funded by BPL and they would ensure the sites were all promoted on zapmap.

ACTION: Fully novate Source London contract to BPL

Anecdotally, usage of the charging points in our car parks is low due to a range of factors including a lack of clear signage, promotion and enforcement.

ACTION: Review signing and lining of EV bays at car parks to clarify for the public who can use them and how long for

ACTION: Review RBK's car parks webpages to ensure information on availability of chargers at car parks is clear and correct.

ACTION: Seek to introduce Traffic Management Orders to allow enforcement of EV bays at all RBK car parks to encourage proper use of these bays

It is likely that usage of these chargers would remain low unless we allow EV users to park for free while connected to chargers in these bays for up to three hours, as we do on street. Failing that parking should be charged at a much reduced rate. The introduction of new Pay on Foot (POF) equipment into our car parks from January to March 2019 is an opportunity to provide free parking for EVs if the POF system is set up in this way..

ACTION: From March 2019, new Pay on Foot equipment to allow up to three hours free parking for EVs when parked in EV charging bays and connected to EV chargers.

The Council is currently considering the introduction of emission based pricing for residents and business parking permits across all controlled parking zones in Kingston. This could mean free permits for 100% electric vehicles and cheaper permit costs for lower emitting vehicles to park in permit holder only bays. Statutory consultation would be required.

Running a cable across the footway

Residents and businesses without off-street parking may be keen to explore the option of charging via a cable across the footway. RBK would discourage this due the danger such a cable could present to other users of the footway, even if a cable protector is used. See Highways Act 1980, c.66, part IX, Section 162. RBK instead encourage people to register their demand for a charging point at powermystreet.co.uk. This demand will then be taken into account when growing the charging point network across the borough.

Current electric vehicle ownership

The Department for Transport (DfT) publishes quarterly data on vehicle registrations.

The latest data (Q2 2018) reported more than 20,300 ULEVs in London

In Kingston, a total of 354 ULEVs were registered in the borough, out of a total of 76,100 registered motor vehicles (about 0.47% of the total vehicle fleet).

The existing total fleet (including both fossil fuel powered and ULEV) in the borough is as follows:

- 66,100 cars (86.9%)
- 3,300 motor cycles (4.3%)
- 5,700 light goods (7.5%)
- 200 heavy goods (less than 1%)
- 200 buses and coaches (less than 1%)
- 600 other vehicles (less than 1%).

The number of ULEVs in adjacent boroughs is as follows:

- Sutton – 314 ULEVs
- Merton – 1073 ULEVs
- Croydon – 622 ULEVs

The data suggests that in total roughly 2,363 ULEVs are registered in Kingston and the adjacent boroughs (the TfL information does not include Surrey County Council information).

About Source London

TfL set up and administered Source London from 2009 to 2014, using government Plugged-in Places and match-funding from partners. Together, the Source London partners have delivered 1,400 publically accessible charge points.

Source London was transitioned to Bluepoint London (BPL), a subsidiary of IER Bolloré, in September 2014.

New licensing requirements for taxis and private hire vehicles

TfL has confirmed new 'zero emission capable' (ZEC) licensing requirements for taxis and private hire vehicles (PHVs) to facilitate a switch to ULEVs. The requirements are shown in the accompanying table.

TfL research notes that ZEC vehicles will require access to charging at home (on-street residential charging) and many will need to charge during working hours (mostly using rapid charging to minimise downtime).

Many taxi drivers will also be customers for on-street residential charging to charge their vehicles between shifts (surveys shows 30% of taxi drivers park on-street).

ACTION: Undertake research to identify and map the number of taxis and private hire vehicles in the borough – this should be done at a postcode level to understand the potential distribution across the borough. This would be subject to Council resourcing and/or bid funding availability

Table 1 New licensing requirements for taxis and private hire vehicles

Date	Taxi and private hire requirement
1 Jan 2018	Newly licensed PHVs must be: <ul style="list-style-type: none"> • Euro 4 if petrol hybrid • Euro 6 if any other model
1 Jan 2020	Newly licensed PHVs must be: <ul style="list-style-type: none"> • ZEC if younger than 18 months • Euro 6 if older than 18 months
1 Jan 2023	Newly licensed PHVs must be ZEC

Requests for charge points from residents and businesses

The Council every so often receives requests for additional on-street charging points from residents and businesses. This may be via written or verbal correspondence.

Until recently, not all of these requests have been logged and as a result some of the requests are missing.

ACTION: Develop and maintain a register of requests for charge points from residents and businesses – this should also be mapped. Encourage requestors to also submit their suggestion on powermystreet.co.uk

Meeting future demand

Facilitate provision of infrastructure based on predicted future demand, including for residents, while prioritising demand from essential commercial vehicles, Zero Emission Capable taxis and private hire vehicles. This will ensure current public funding will also support Londoners who cannot currently afford to switch to an EV but would like to do so in the future, for example, when the second hand market is more developed

This section of the report looks at the potential growth in ULEVs in the borough from a number of perspectives. This information is based on the research undertaken by TfL.

When reading this section of the report, it should be read as a calculated judgement of what the future may look like and not as fact.

Various factors can affect the rate of uptake of EVs, including in the longer term, the likelihood of autonomous vehicles operating in London. These vehicles would likely be EV. Testing is ongoing in some London boroughs and their charging requirements will depend on the nature of the technology and the business models employed.

In this report, future uptake is tackled from four perspectives, namely:

- Future uptake by households – looking at defining characteristics of the early adopters of ULEVs
- The potential future uptake by commercial vehicles – looking at the existing fleet
- Conversion of existing car club vehicles to ULEV and future provision, and
- Scenario testing on the proportions of ULEVs as new vehicles and resulting fleet mix (see Appendix A1).

Future uptake by households

The EV Uptake and Infrastructure Impacts Study (Element Energy and WSP Parsons Brinkerhoff, 2016) identified several key characteristics that correlate with the current distribution of EV sales in London.

This can help boroughs and charge point network providers to identify where future EV uptake is likely to be in the short-medium term.

The key identifying characteristics were found to be, in order of correlation:

- Employment – persons employed per household
- High earning households – percentage of households with income above £75,000
- Local EV policy – presence of supportive policy, for example, free parking for ULEVs
- Hybrid sales share – identifying where potential early adopters of new vehicle technology live.

Uptake in future years was predicted by applying these characteristics to projected population and car sales in 2020 and 2025.

ACTION: Undertake a mapping exercise for Kingston using the identifying characteristics to better understand potential ULEV adoption in the short-medium term across the borough. This would be subject to Council resourcing and/or bid funding availability

Future uptake of commercial electric vehicles

The term ‘commercial vehicles’ refers to a wide range of vehicle types with varied usage patterns. This could include vehicles used for deliveries, business travel, taxis and private hire vehicles.

Many operators will keep vehicles in depots so will need to install their own charge points for charging overnight or between shifts.

Other vehicles will be kept at workers’ homes overnight. If that worker does not have access to a driveway, they will need access to on-street residential charging.

Both depot-based and home-based vehicles are likely to need access to rapid charging to ensure that they can charge up quickly during their working day without losing valuable working time.

The DfT vehicles registrations data for Q2 of 2018, includes 5,700 light goods vehicles, 200 heavy goods vehicles and 200 buses and coaches.

This provides an estimation of the number of commercial vehicles in Kingston – excluding cars used for commercial purposes.

Car clubs

London’s car club industry has an ambition to serve one million members annually in 10,000 car club vehicles by 2025, with ULEVs comprising 50 per cent of the fleet. This would result in car clubs deploying 5,000 ULEVs in London by 2025.

Kingston currently operates a round-trip car club (through Zipcar), where a car club member books a specific car, located in a dedicated parking bay, for a period of time and then returns the car to the same dedicated parking bay before the end of the reserved time.

At present, all car club vehicles are diesel or petrol vehicles – with operators looking at the potential to convert to ULEVs.

Exposure to use of ULEVs as a member of a car club can help change people’s perception of EVs which may encourage users to choose an EV if they decide to purchase a vehicle at a later date.

ACTION: The opportunity for conversion of the existing car clubs to ULEV should be investigated and encouraged.

The right charge point in the right place

Use different types of charge points according to the type of user to ensure the most appropriate infrastructure

General requirements

To ensure their charge points are open for use to as many customers as possible, all charge point network operators should ensure they:

- Use standard plugs (Type 2 connectors)
- Use the latest Open Charge Point Protocol (OCPP)
- Are interoperable with other networks and/or offer a pay as you go option
- Provide an app and website to help customers locate available charge points
- Have a clear pricing structure

To help combat climate change and impact to air quality due to burning of fossil fuels, the council will seek to work with operators who can ensure they source 100% renewable energy for their network.

Type of charging points

TfL guidance indicates that the locating of different types of charging points should be based on the street types in the borough.

The three types of charging points are:

- Residential on-street charging
- Rapid charging, and
- Destination/top-up charging.

Street types

The Council, in consultation with TfL, have categorised all the streets in Kingston based on the nine street types.

Street types can be a useful tool to help identify where different infrastructure types could be located. More detail related to street types is located in Appendix A2.

Residential on-street charging

Most appropriate on **Local Streets** – these streets make up 80% of London's road network and are where the majority of people live.

Residential on-street charge points are needed for regular charging, usually when vehicles are parked overnight. Slow (3kW) or fast (7kW) charging is sufficient for overnight charging as it provides a full charge in four to eight hours.

The key customers for residential charge points are residents without access to off-street parking, visitors of residents, including servicing and deliveries, local businesses and car clubs.

Charge points should be close to ULEV owners' houses but not necessarily directly outside or on their street – customer research (conducted by Future Thinking, see Research spotlight 8) shows that most ULEV users are willing to walk five minutes to a charge point and three quarters will walk up to 10 minutes.

For residential charging, charge points should ideally be available within a five minute walk of owners' houses, but not necessarily directly outside if this causes conflict with other residents.

ACTION: Undertake a mapping exercise for Kingston to identify residents without access to off-street parking (this could be based on an assessment of land use and building envelopes). This would be subject to Council resourcing and/or bid funding availability

Rapid charging

Rather than aiming for a particular street type, rapid charge points will mostly be located in **off-street hubs** or in dedicated locations.

Streets with **high 'movement' or high 'place'** function could provide a high demand for rapid charging, particularly areas where ULEVs are incentivised, for example Neighbourhoods of the Future or Low Emission Neighbourhoods.

Rapid charge points provide charging for high mileage users such as ZEC taxi and PHV drivers and freight and fleet operators.

These points could also be used by residents and visitors if slower standard charging is not available.

Rapid charging points should be close to strategic routes where off-street hub locations can provide a number of charge points to reduce queuing anxiety.

Taxis will need rapid charge points particularly in and around transport hubs to be near popular pick-up, drop-off and break locations.

ACTION: Undertake a mapping exercise for Kingston to identify potential off-street hubs (whether Council-controlled or private) in close proximity to streets with high 'movement' or high 'place' functions, where demand for rapid charging is most required. This should also take into account land use.

TfL have installed a rapid charger at Ace Parade, Hook Road by the junction with the A3 and more are going through the planning process.

London Councils Transport and Environment Committee recently resolved to commit each borough to suggesting 20 sites for consideration for rapid chargers. Suggestions are to be made by the end of January 2019 with assessment, planning applications and eventual installation following at a later date.

ACTION: Submit to TfL a minimum of 20 possible sites (selected in line with this policy) for rapid chargers by end of January 2019

Destination/top-up charging

Most appropriate locations – **high streets and city streets**, because destination and top-up charge points will be most needed in areas that attract car trips and where short-medium term parking is available.

They will also be suited to off-street car parks of any type of street.

Private ULEV users will normally use residential charging to regularly charge their vehicles fully overnight. However, they are also likely to occasionally use top-up facilities away from their homes. These can be used in an ad hoc manner, either through signing up to a membership scheme or by pay as you go.

Destination/top-up charging will be most viable where there is a steady turnover of vehicles that stay for a few hours, such as in retail or leisure parks or town centre car parks.

Destination/top-up charging will be especially valuable in areas of poor local air quality and where the borough is promoting EVs, such as Neighbourhoods of the Future and Low Emission Neighbourhoods.

ACTION: Undertake a mapping exercise for Kingston to identify:

- **High streets and city streets**
- **Potential off-street hubs (whether Council-controlled or private) across the borough, and**
- **Neighbourhoods of the Future and Low Emission Neighbourhoods.**

Emerging themes / risks

Proactive provision

ULEV uptake in Kingston, and across London, is in the early stages. The Council has an opportunity to be proactive and manage the growth of charging points and policy to support the shift from fossil-fuels to electric vehicles.

There is a risk that if the Council does not manage the uptake of ULEVs in a positive way, this could slow the uptake in the borough.

ACTION: Adopt this proposed ULEV policy in order to proactively manage the uptake of ULEVs in the borough.

Political and community acceptance

TfL research shows that ULEVs will form a larger part of the vehicle fleet over time. However, as with all new technologies there may be political and community resistance to change.

Action: Partner with TfL and the Scheme Operators to develop political and community acceptance of ULEVs.

Built heritage conservation areas

Careful consideration of how electric vehicle charging infrastructure is embedded in built heritage conservation areas is required. This will need to be managed in order to build political and community acceptance.

ACTION: Undertake a study to review the built heritage conservation area requirements as relevant to ULEV charging points.

Role of the Council

So far, this paper has identified the types of charging points and policy guidelines that can be implemented to support the take up of ULEVs – but does not make much comment on Council's role.

Any ULEV policy needs to clearly articulate the role of Council as a Local Planning Authority (conditioning new charging points) and a Scheme Partner (working with Scheme Operators to identify and implement publically-accessible charging points).

As a Scheme Partner, the Council creates an enabling environment for Scheme Operators to deliver charging points in the borough (based on a ULEV policy).

The Council also receives a reimbursement from the Scheme Operator for use of the highway and off-street car parks (currently around £300 per annum per space and a portion of the profit).

The cost of implementing and managing the charging points is borne by the Scheme Operator – at no cost to the Council (excluding the opportunity cost of lost parking revenue).

To assure a no net loss in revenue to the Council in the medium-term (next 1-5 years), on-street charging points should not be implemented in areas where car parking revenue per bay is more than £300 per annum.

Lamp column charging

The TfL research, as well as discussions with BPL and other boroughs, noted lamp column charging as one mechanism to implement residential on-street charging points.

However, introducing such charging points require a number of issues to be resolved, including:

- Charging for electricity – as lamp columns are currently unmetered
- Safety issues – cables between the lamp posts and vehicles are a tripping hazard for pedestrians
- Suitability of technology – distance of lamp columns from highway, compatibility of charging with lamp columns.

Once the above criteria were applied, only a small proportion of lamp columns would be suitable as electric charging points. But the suitability of lamp column charging should be investigated for the borough, building on studies conducted for Kingston and Sutton's Shared Environment Service.

ACTION: Apply the SES's lamp column charging study to determine the feasibility of lamp column charging in the borough and seek funding for a pilot.

National Grid insights

The [National Grid energy insight](#) into electric vehicles aims to clarify the estimated increase in electricity demand due to ULEVs.

They estimate peak demand from electric vehicles alone to be 5 GW, about an 8% increase on today's peak demand value by 2040.

Peak demand is planned to be met with a combination of more flexible electricity generation sources – predominantly gas.

The National Grid also assume that people will use smart chargers to charge up their cars and price differences between peak and off-peak to reduce peak demand.

Alternative technologies

Estimating the potential uptake of ULEVs is complicated as a number of technologies are currently in development at the same time.

Autonomous vehicles can be seen as either complementary or competition to ULEVs. For example, if they are provided as a private-hire fleet, then charging could occur in a centralised location (away from town centres and hubs of activity).

With improvements in the range of ULEVs, they will require charging less often – resulting in the potential for less demand for rapid and destination/top up charging points.

Alternative technologies such as induction plates and liquid electrolytes are also in development.

The take up of hydrogen fuel cell electric vehicles (FCEVs), as the technology develops and is made commercially available, could potentially render electric charging points redundant. But current estimates suggest that FCEVs will not become mainstream until between 2030 and 2040.

All of the above alternative technologies should be reviewed periodically so that appropriate updates to the ULEV policy can be made in a timely manner.

ACTION: Undertake regular and frequent monitoring of alternative technologies – such as autonomous vehicles, improved range and hydrogen fuel cell electric vehicles and update the ULEV policy as necessary.

Proposed ULEV policy

The following section of this report summarises a proposed approach to implementing additional ULEV charging points (both on-street and off-street). This is based on the charging point type, being either for residential charging, rapid charging or destination/top-up charging. Hydrogen cell vehicles are yet to be considered.

It should be noted that there is a significant resource implication associated with the expansion of charging networks and that the pace of expansion will be dictated by the availability of resources from internal or external sources. The procurement implications of network expansion will also need to be carefully considered before implementation.

On-street installation will require detailed consideration of the impact upon scarce kerb-space, particularly in residential areas.

This ULEV policy generally covers Council-controlled land and developments (with ten or more car parking spaces). It excludes residents installing charging points in existing properties.

Council's role

Local Planning Authority

A Local Planning Authority is the local authority or council that is empowered by law to exercise statutory town planning functions for a particular area of the United Kingdom.

In its role as Local Planning Authority, the Council can condition developers to include ULEV (both active and passive) charging points as part of a proposed development.

Scheme Partner

A Scheme Partner is any person or organisation who enters into a charging point partnership agreement with the Scheme Operator. In its role as Scheme Partner, the Council works in partnership with the Scheme Operator to identify and introduce additional charging points – with a monetary reimbursement provided by the Scheme Operator. Responsibility for implementing and managing charging points remains with the Scheme Operator.

Scheme Operator

The Scheme Operator is responsible for managing the scheme at its own cost. This includes promoting and marketing the scheme, implementing a dedicated website or microsite, administering the application and registration process for scheme users and reimbursing the Scheme Partner in accordance with the conditions of the contract.

This ULEV policy does not expect the Council to be a Scheme Operator – but rather a Scheme Partner.

Definition of terms

Charging point categories

Slow chargers

Slow chargers (up to 3kW) are best for overnight charging and usually take between 6 and 12 hours for a pure-EV, or 2-4 hours for a PHEV.

Fast chargers

Fast chargers cover those with 7kW and 22kW power outputs, which typically charge an EV in 3-4 hours.

Rapid chargers

Rapid chargers are divided in two sections – AC and DC. Currently available Rapid AC chargers are rated at 43kW, while Rapid DC are typically 50kW. Both will charge an EV to 80% in around 30 minutes.

Local Planning Authority

In its role as LPA, the Council can condition developers to include ULEV (both active and passive) charging points as part of a proposed development.

Scheme Partner

In a role as Scheme Partner, the Council would work in partnership with the Scheme Operator to identify and introduce charging points, with a monetary reimbursement provided by the Scheme Operator.

Scheme Operator

The Scheme Operator is responsible for managing the scheme at its own cost.

Charging point type

Residential on-street charging

Residential on-street charge points are needed for regular charging, usually when vehicles are parked overnight. Slow (3kW) or fast (7kW) charging is sufficient for overnight charging as it provides a full charge in four to eight hours.

Rapid charging

Rapid charge points provide charging for high mileage users such as ZEC taxi and PHV drivers and freight and fleet operators.

These points could also be used by residents and visitors if slower standard charging is not available.

Destination/top-up charging

Private ULEV users will normally use residential charging to regularly charge their vehicles fully overnight. However, they are also likely to occasionally use top-up facilities away from their homes. These can be used in an ad hoc manner, either through signing up to a membership scheme or by pay as you go.

General requirements

To ensure their charge points are open for use to as many customers as possible, all charge point network operators should ensure they:

- Use standard plugs (Type 2 connectors)
- Use the latest Open Charge Point Protocol (OCPP)
- Are interoperable with other networks and/or offer a pay as you go option
- Provide an app and website to help customers locate available charge points
- Have a clear pricing structure for users.

Residential charging

On-street

Policy objective:

Support access to on-street residential charging points to those without access to off-street parking (in appropriate locations)

Charge point speed

Slow and/or fast (publically accessible)

Council role

Scheme Partner

Scheme Operator

Council-approved Scheme Operator

Criteria for implementation

Street type

Local streets

Land use / centre type

Residential without off-street availability

Availability of alternative charging point

Not within 400m of alternative slow or fast charging point – unless usage warrants

Opportunity cost

Existing parking space revenue is approximately £300 per annum – which is roughly the amount that Council could expect from the Scheme Operator.

Off-street

Policy objective:

Ensure adequate provision for ULEVs in new developments – both now and into the future

Charge point speed

Slow and/or fast (private – for residents)

Council role

Local Planning Authority

Scheme Operator

Council-approved Scheme Operator

Criteria for implementation

As per London Plan

Car clubs

Policy objective:

Enable 50% of car club vehicles to be ULEV by 2025 – supporting the Mayor's Transport Strategy

Charge point speed

Slow and/or fast (private – for car club use)

Council role

Scheme Partner for Council assets

Local Planning Authority for non-Council assets

Scheme Operator

Council and/or car club approved operator

Criteria for implementation

Street type

Local streets or off-street car park

Land use / centre type

N/A – implemented as part of a wider car club strategy or development condition

Availability of alternative charging point

N/A – implemented as part of a wider car club strategy or development condition

Rapid charging

Off-street

Policy objective:

Facilitate a network of off-street rapid charging points across the borough – close to strategic routes and in/around major town centres, transport hubs and industrial areas.

Charge point speed

Rapid (publically accessible)

Council role

Scheme Partner for Council land

Local Planning Authority for non-Council land

Scheme Operator

Council-approved Scheme Operator

Criteria for implementation

Street type

Off-street hubs in proximity to streets with high 'movement' or high 'place' function (core road, high road, city hub, city street, city place)

Land use / centre type

Close to strategic routes and in/around major town centres, transport hubs and industrial areas.

Availability of alternative charging point

Not within 400m of alternative rapid charging point – unless usage warrants

Destination/top-up charging

On-street

Policy objective:

Support residential and off-street rapid charging network with destination/top-up charging points along high streets and city streets – near key destinations such as shopping centres, retail parks, town centre car parks and transport hubs.

Charge point speed

Fast or rapid (publically accessible)

Council role

Scheme Partner

Scheme Operator

Council-approved Scheme Operator

Criteria for implementation

Street type

High streets and city streets

Land use / centre type

Key destinations such as shopping centres, retail parks, town centre car parks and transport hubs

Availability of alternative charging point

Not within 400m of alternative fast or rapid charging point – unless usage warrants

Opportunity cost

Existing parking space revenue is approximately £300 per annum – which is roughly the amount that Council could expect from the Scheme Operator.

Off-street

Policy objective:

Support residential and off-street rapid charging network with destination/top-up charging points off-street – near key destinations such as shopping centres, retail parks, town centre car parks and transport hubs.

Charge point speed

Fast or rapid (publically accessible)

Council role

Scheme Partner for Council assets

Local Planning Authority for non-Council assets

Scheme Operator

Council-approved Scheme Operator

Criteria for implementation

Street type

Off-street car parks

Land use / centre type

Key destinations such as shopping centres, retail parks, town centre car parks and transport hubs

Availability of alternative charging point

Not within 400m of alternative fast or rapid charging point – unless usage warrants

Action Plan

Equalities issues will be considered within all listed actions.

Action	Frequency	Lead	Cost
Short-term (FY18/19)			
Review, refine and adopt ULEV policy	-	Councillors	-
Subject to Council resourcing and/or bid funding availability, undertake additional mapping exercises, identifying: <ul style="list-style-type: none"> Existing and proposed ULEV charging points based on approved development conditions Potential ULEV adoption in the short-medium term across the borough (using the identifying characteristics) Residents without access to off-street parking (based on an assessment of street types, land use and building envelopes) Number of taxis and private hire vehicles in the borough (at a post code level to understand the potential distribution across borough) Potential off-street hubs (whether Council-controlled or private) in close proximity to streets with high 'movement' or high 'place' functions High streets and city streets (suitable for destination/top-up parking) Potential sites for Neighbourhoods of the Future and Low Emission Neighbourhoods 	-	RBK Sustainable Transport Team	-
Seek to bid for Residential GULCS funding when bidding opens in November 2018, enabled by investigating the use of s106 and/or CIL funds to provide the required 25% match funding	-	RBK Sustainable Transport Team / Planning Officers	-
Medium-term (Next 1-5 years)			
Sign the novated SourceLondon agreement with BPL to give them responsibility for our Source London charging points and enable implementation of additional residential on-street charging points in line with the ULEV policy – based on discussions with the Scheme Operator and residents and businesses requests logged on powermystreet.co.uk .	Ongoing	RBK Sustainable Transport Team /RBK Legal Services / Scheme Operator	-
Review promotion, signing, lining, cost of parking and enforcement of EV bays in RBK car parks to encourage usage of these chargers. Must happen in partnership with Scheme Operator to ensure work to upgrade chargers is coordinated with this work.	Ongoing	RBK Sustainable Transport Team / NSL and RBK Parking / Scheme Operator	up to £10k
Identify and implement off-street rapid charging points in line with the ULEV policy – based on discussions with TfL, the Scheme Operator and residents and businesses requests. Using GULCS framework contract which is cost neutral to councils. London Councils TEC has agreed that boroughs should suggest 20 further potential sites by end of Jan 2019 for TfL to assess	Ongoing	RBK Sustainable Transport Team / RBK Procurement / Scheme Operator / TfL	-
Identify and implement destination/top-up charging points in line with the ULEV policy – based on discussions with TfL, Scheme Operator and businesses	Ongoing	RBK Sustainable Transport Team / Scheme Operator / TfL	-
Apply the recent lamp column charging study for Sutton to RBK's assets and identify options for implementation in RBK beginning with a pilot	Once off	RBK Sustainable Transport Team	£50k
Monitor progress in the development of autonomous vehicles and hydrogen fuel cell electric vehicles – this is to ensure that the charging points are fit-for-purpose and not based on redundant technology	Ongoing	RBK Sustainable Transport Team	

Review, refine and adopt ULEV policy as part of Local Plan review – this would include any amendments to the policy guidelines	Every 10 years	RBK Sustainable Transport Team	£10k
Support procurement of EV fleet - Ensuring where possible charging infrastructure supports the council fleet as well. Harmonising the plans for council vehicles and infrastructure with that of the public.	By March 2020	Commissioning and Procurement	No increase from current contract
Ongoing			
Implement additional residential off-street charging points in line with the ULEV policy – based on development conditions	Ongoing	RBK Sustainable Transport Team / Scheme Operator	-
Implement additional ULEV car club bays as part of a wider car club strategy or development condition	Ongoing	RBK Sustainable Transport Team / Scheme Operator	-
Subject to Council resourcing and/or bid funding availability, update mapping as required and new information is made available	Ongoing	RBK Sustainable Transport Team	-
Develop and deliver a marketing campaign promoting ULEVs in borough – this should include the reason, options and Council approach	Annually	RBK Sustainable Transport Team	£10k
Refer requests for charge points from residents and businesses to powermystreet.co.uk	Ongoing	RBK Sustainable Transport Team	-
Monitor and review charging point usage at each of the Council provided sites – and non-Council provided sites if the data is made available	Biannually	RBK Sustainable Transport Team / Scheme Operator	-

References

The following studies have been used in the production of this guidance:

- Plug-in electric vehicle uptake and infrastructure impacts study, Element Energy and WSP Parsons Brinckerhoff (2016)
- Electric vehicle charging study: A review of options for charging at homes without off-street parking, WSP Parsons Brinckerhoff (2015)
- A feasibility study into a rapid charge network for taxis, Energy Saving Trust (2015, updated 2016)
- Mapping rapid charge point locations for commercial vehicles in London, Energy Saving Trust (2015)
- Rapid Charging Network Study, Element Energy (2015)
- ULEV car club Study, WSP Parsons Brinckerhoff and Frost & Sullivan (2016)
- Understanding electric vehicles – research findings, Future Thinking (2014)
- Mapping rapid charge point locations for private hire vehicles in London, Energy Saving Trust (2017)
- Private hire vehicle rapid charging points: Research findings, Future Thinking (2016)
- The road to reducing commercial vehicle emissions: Exploring the technical barriers to uptake of alternatively fuelled commercial vehicles (2016)
- How can LoCITY increase operator uptake of ultra low emission vehicles? (2016)
- Electric vehicles: Gauging interest amongst disabled and elderly drivers, 2CV (2016)

The studies can be found at: www.tfl.gov.uk/ulev-research

Appendix A1 – Fleet Mix and Scenario Testing

Fleet mix

There is much ongoing debate over the timing and rate of acceleration of demand for EVs and much is unknown even by industry experts involved in the Mayor's EV Taskforce this year.

As battery range increases, prices reduce and a used EV market matures, EVs will become an attractive option for drivers. Government policy around grants for purchase of vehicles and home chargers is a factor and availability of publicly accessible charging points in residential areas is likely to remain in the near future a key factor influencing buyers' decisions.

The EV Taskforce will report its findings in Spring 2019 to help guide the growth of EV charging infrastructure in London.

DfT data shows that in 2018 Q2, nationally 15,593 ULEVs were registered for the first time in the United Kingdom, up 37% on 2017 Q2 and 61% on 2016 Q2.

ULEVs accounted for 2.1% of all new vehicle registrations - up from 1.5% one year previously and 1.2% two years previously.

Most of this increase has been due to vehicles eligible for plug-in car and van grants. New registrations of ULEVs in 2018 Q2 included 13,807 cars and 218 light goods vehicles of models that were eligible for these grants, which was 90% of all ULEVs registered for the first time.

During the year ending June 2018, the most common generic models of ULEV registered for the first time were the Mitsubishi Outlander with 7,381 vehicles, followed by the BMW 3 Series with 6,181 vehicles and the Nissan Leaf with 5,248 vehicles. These were all plug-in hybrid vehicles; the most common generic model for non plug-in ULEVs was the Toyota Prius with 2,544 non plug-in cars.

Scenario testing

The EV Uptake and Infrastructure Impacts Study (Element Energy and WSP Parsons Brinkerhoff, 2016) attempted to predict likely uptake of EV in the UK in future years.

Their baseline scenario (effectively a 'medium' rate of uptake scenario), projections indicate that the number of ULEVs in Kingston could be about 756 vehicles in 2020 and reach approximately 6,048 ULEVs by 2025.

By 2020 – about 1% of the total vehicle fleet may be ULEV (dominated by plug-in hybrid vehicles).

By 2030 – the proportion of non-ULEV vehicles could reduce to about 92%. Plug-in hybrid vehicles could grow to 6% of the fleet, while battery electric vehicles 2%. The calculations suggest that by 2030 hydrogen fuel cell electric vehicles will comprise a negligible portion of the total fleet.

By 2040 – the proportion of non-ULEV vehicles is estimated to reduce to about 69%. Plug-in hybrid vehicles would account for 18% of the fleet, while battery electric vehicles 10% and hydrogen fuel cell electric vehicles would form roughly 3% of the fleet.

By 2050 – the proportion of non-ULEV vehicles could fall further. Plug-in hybrid vehicles could account for 44% of the fleet, while battery electric vehicles 15% and hydrogen fuel cell electric vehicles roughly 10% of the fleet.

FINDING: The fleet mix calculations suggest that plug-in hybrid vehicles will grow over time and could potentially account for 44% of the fleet by 2050. Hydrogen fuel cell electric vehicles will become popular between 2030 and 2040.

Projected UKLEVs (cars and vans) in London boroughs in the baseline and high BEV scenarios (based on EE & WSP PB model, 2015)

Borough name	Baseline scenario			High scenario		
	2015	2020	2025	2015	2020	2025
Barking and Dagenham	21	309	1,038	21	399	4,210
Barnet	332	2,200	9,215	332	4,741	16,337
Bexley	142	1,128	4,440	142	2,127	10,247
Brent	153	1,208	4,768	153	2,293	8,551
Bromley	119	1,053	4,034	119	1,860	12,677
Camden	131	1,060	4,169	131	1,984	6,151
City of London	16	106	447	16	232	525
Croydon	216	1,661	6,618	216	3,214	13,322
Ealing	157	1,263	4,963	157	2,373	11,270
Enfield	110	966	3,695	110	1,710	10,835
Greenwich	53	444	1,714	53	808	6,065
Hackney	64	536	2,080	64	981	4,018
Hammersmith and Fulham	85	577	2,390	85	1,216	4,615
Haringey	98	716	2,897	98	1,433	6,295
Harrow	153	1,078	4,428	153	2,226	10,718
Havering	67	788	2,777	67	1,162	8,805
Hillingdon	243	1,598	6,764	243	3,469	17,541
Hounslow	78	728	2,741	78	1,235	7,070
Islington	137	916	3,831	137	1,964	5,397
Kensington and Chelsea	127	802	3,431	127	1,794	5,917
Kingston upon Thames	101	716	2,933	101	1,468	7,453
Lambeth	56	476	1,840	56	864	5,098
Lewisham	36	386	1,398	36	599	5,298
Merton	52	506	1,890	52	839	5,105
Newham	31	311	1,136	31	501	4,157
Redbridge	173	1,208	4,970	173	2,506	11,261
Richmond upon Thames	276	1,719	7,372	276	3,872	11,839
Southwark	48	435	1,654	48	758	3,636
Sutton	79	688	2,648	79	1,224	8,103
Tower Hamlets	123	871	3,553	123	1,784	5,567
Waltham Forest	71	650	2,457	71	1,117	6,512
Wandsworth	195	1,310	5,460	195	2,793	10,022
Westminster	204	1,314	5,593	204	2,893	7,832

Appendix A2 – Roads Task Force Street Types

The Roads Task Force (RTF) was set up by the then-Mayor of London in 2012 to tackle the challenges facing London's streets and roads.

The RTF proposed a 'street family' of nine street types, in which streets are defined by significance of their 'movement' and the intensity of their 'place'.

Work has been undertaken between TfL, RFT and RBK to classify the roads in the borough based on the nine street types.

High place function

City places

City places are areas with a high concentration of commercial activity, entertainment venues and cultural landmarks. May not be appropriate for any form of EV charging.

Town squares

Town squares are destinations for local people accessing local shops or services such as street markets.

Local streets

The majority of Londoners live on streets that are used mainly by local vehicles and pedestrians who live on them to access their homes, go to work, school or to access local shops and services

Some local streets are also used by cyclists as an alternative to busier routes and can provide spaces for children to play.



Source: Transport for London, 2017

Medium place function

City streets

City streets are widely known for their concentration of commercial and cultural street activity.

They play an important role in perceptions of London as a place to visit and do business in. They cater for large volumes of visitors.

City streets provide for essential traffic, in particular public transport and freight/servicing.

High streets

High streets provide a destination for large numbers of people accessing shops, restaurants and other services. They are found across London, they are the lifeblood of local communities.

Connectors

Connectors play an important role in the movement network, providing key connections between places.

They can vary from local routes carrying light volumes of traffic to busier roads that provide important links from arterial and high roads to other parts of London.

Land uses vary along connectors and include small parades of shops, homes and workplaces, but the priority is on passing through rather than being destinations in themselves.

Low place function

City hubs

City hubs are part of the strategic road network but with high aspirations for quality of place.

They are important destinations for visitors and residents, with a wide range of leisure, retail, community and other services.

High roads

High roads accommodate large volumes of traffic handling in excess of 20,000 vehicles a day, while also serving major town centres and being a focal point for community life.

Core roads

Core roads are essential for business, bringing goods into and out of London. Trip lengths vary with arterial roads catering for long-distance as well as shorter trips.