Electric Vehicle Infrastructure Review: 12 Month Update

Committee name	Corporate Services & Infrastructure Select Committee
Officer reporting	Poonam Pathak, Place Directorate
Papers with report	Appendix 1 – EV units Select Committee recommendations 2022
Ward	All

HEADLINES

The report provides a 12-month update on the former Public Safety & Transport Select Committee's major review into Electric Vehicle (EV) Infrastructure, approved by the Cabinet. This report will act as the annual report into the implementation and condition of the Borough's EV infrastructure.

RECOMMENDATIONS

That the Corporate Services and Infrastructure Select Committee notes the contents of the report and provide any comments to officers as appropriate on the EV Infrastructure implementation by the Council.

SUPPORTING INFORMATION

Background

The UK government announced in 2021 that the sale of cars powered solely by petrol and diesel would be prohibited by 2030, which has now been extended until 2035. In response to the UK government's statement in 2021, TfL modified the 'Mayors Transport Strategy 2018' and altered its commitment to achieving a net-zero carbon objective for London by 2030, including the deployment of EVs as a key component of the strategy.

The Council's 'Strategic Climate Change Action Declaration and Plan (Released July 2021)' and 'Local Implementation Plan (LIP) 2019–2041' established a primary goal to deliver and improve electric vehicle (EV) charging infrastructure throughout the borough for both present and future EV customers.

In support of these plans the Council developed and approved the EVCP Strategy last year which outlines:

EVCP types - The selection of suitable EVCP types based on local user needs.
Setting targets - Targets for the introduction of EVCPs across the network.
Delivery model - A model for EVCPs from installation, operation maintenance and life expiry.
Delivery plan - The short-, medium- and long-term EVCP delivery plan.

In summary, the Council's strategy which was approved last year suggests the installation of 300 EVCPs on/off-highway Council-owned property located around the borough (including maintenance compounds and depots) by 2030, including both Council and private land. In addition to developing the EV strategy last year, the council successfully completed the procurement process to obtain a new EV partner to assist with implement the EVCP infrastructure in the borough in order to meet the EV commitment.

Delivery Model

The Council has a short, medium and long term delivery plan for the introduction of EVCP charging infrastructure on adopted Highway or other Council owned property, each stage of the delivery plan is –

Short Term (2023)	= remove / upgrade / remove legacy assets based on independent assessment of each site.
Medium Term (2026)	= introduce 125 public destination EVCPs on off-street Council property.
Long Term (2030)	= introduce 300 public destination EVCPs on off-street Council property.

The Council proposed a number of funding options in order to find the optimum finance model for implementing EV infrastructure; nonetheless, the Council's preferred commercial model is an EV charging infrastructure that is partially funded/ shared by the Council. This option has given the Council control over the EV rollout alongside the supplier while also obtaining a competitive revenue share option that best serves the Council's vision and values, particularly that focused on residents and stakeholders.

Delivery Progress

The short-term programme to upgrade the existing EVCP in our car parks is now being implemented. We have also increased the number of electric vehicles charging points in the car parks. The phase 1 of the project entailed the installation of 46 EVCPs of 7 KW and utilise the existing feed in the car parks. This phase of work is almost completed, with the exception of a few of locations that remain due to site conditions. In addition, 14 rapid EVCPs with a capacity of 75 -150KW will be deployed in our car parks and are expected to be completed soon.

The officers have secured he On-Street Residential Chargepoint Scheme (ORCS) funding in order to install both on-street and EVCPs in our car parks as part of the Phase 2 installation programme. This grant will allow us to build an additional 34 EVCPs throughout the borough based on demand and in areas where off-street parking is not available. The feasibility investigation for these locations is under way and a work plan will be developed accordingly.

Local Electric Vehicle Infrastructure (LEVI) funding - The government has announced the LEVI Fund, a £400 million capital grant scheme administered by OZEV and supported by the Energy Saving Trust, Cenex, and PA, to assist local authorities in England to collaborate with the chargepoint industry to improve the rollout and commercialisation of local charging infrastructure. London will receive £35.6 million across the borough for EV infrastructure. The Expression of Interest for this bid was submitted last year. This will be a joint bid with other boroughs, and we will submit our bid application alongside Harrow, Hammersmith and Fulham, Ealing, Brent, and

Haringey, as per the application requirement. This partnership has been granted £7.5 million, which will be shared between the boroughs. The stage 2 application is currently being prepared for submission. To be eligible for grant funding, a separate procurement process will be essential. The officers are working on site selection and demand mapping in preparation for the bid. The grant condition imposes that the majority of the installations be on-street EVCPs to assist residents. If the bid is successful, we could receive C£1.2 million to install EVCPs in the borough, additional match funds from the suppliers.

SELECT COMMITTEE RECOMMENDATIONS

As a reminder to the Committee, and to act as a guide on the Council's progress, attached are the recommendations of the former select committee on their major review into the Borough's electric vehicle infrastructure, which was approved by Cabinet in March 2022.

RESIDENT BENEFIT

The proposed EV strategy and delivery plan will assist the council meet its commitment to carbon reduction and cleaner air by increasing the use of electric vehicles charging infrastructure in the borough. As more electric vehicles are purchased, the demand for EV charging infrastructure will rise. Improved EV charging facilities will benefit residents by providing easy access to charge their vehicles.

FINANCIAL IMPLICATIONS

The preferred Council option on commercial model is an EV charging infrastructure that is partially funded / shared by the Council.

Phase 1 EVCP – installation programme – These works had been authorised adopting the recommended 50/50 investment approach. Our EV provider, APCOA, offered a discount to implement the Phase 1 EVCPs, hence the council will only pay 27.4% of the overall investment cost. The council's investment cost will be paid by the S106 Air Quality Fund. The operation and maintenance costs will be calculated based on the supplier's tendered rate and annual inflation. The revenue share will likewise be determined using the tendered shared option.

Phase 2 EVCP – The officers received ORCS funding to progress the Phase 2 work programme, as well as £100k in match funding from our supplier to implement the Phase 2 EVCP installation plan. The officers will bid for LEVI funds to increase the number of EVCPs in the borough.

LEGAL IMPLICATIONS

None.

BACKGROUND PAPERS

Select Committee Full Review report

APPENDIX 1

1. Phase 1a - Replacement of 22 existing EV Units

Locations

Car Park Name	Address	Area	No. EVCPs
Botwell Green Car Park	Central Avenue, Hayes, UB3 2LU	Hayes	2
Brandville Road Car Park	Brandville Road, West Drayton, UB7 7LT	West Drayton	2
Fairfield Road Car Park	Fairfield Road, Yiewsley, UB7 8EY	Yiewsley	2
Green Lane Car Park	Green Lane, Northwood, HA6 2GX	Northwood	2
Highgrove Pool Car Park	Hume Way, Ruislip, HA4 8DZ	Ruislip	2
Hillingdon Sports & Leisure Complex	Gatting Way, Uxbridge, UB8 1ES	Uxbridge	2
Pembroke Gardens Car Park	Pembroke Gardens, Ruislip, HA4 8NX	Ruislip Manor	2
Pump Lane Car Park	Pump Lane, Hayes, UB3 3LJ	Hayes	2
Ruislip Lido Willow Lawn Car Park	Reservoir Road, Ruislip, HA4 7TY	Ruislip	6
Total			**22**

2. Phase 1b - Installation of 24 additional EV units

Locations

Car Park Name	Address	Area	No. EVCPs
Botwell Green Car Park	Central Avenue, Hayes, UB3 2LU	Hayes	2
Brandville Road Car Park	Brandville Road, West Drayton, UB7 7LT	West Drayton	2
Civic Centre Car Park	Cricket Field Road, Uxbridge, UB8 2NZ	Uxbridge	6
Fairfield Road Car Park	Fairfield Road, Yiewsley, UB7 8EY	Yiewsley	2
Green Lane Car Park	Green Lane, Northwood, HA6 2GX	Northwood	2
St Martins Approach Car Park	St Martins Approach, Ruislip HA4 8BD	Ruislip	3
Pembroke Gardens Car Park	Pembroke Gardens, Ruislip, HA4 8NX	Ruislip Manor	3
Pump Lane Car Park	Pump Lane, Hayes, UB3 3LJ	Hayes	2
Ruislip Lido Willow Lawn Car Park	Reservoir Road, Ruislip, HA4 7TY	Ruislip	2
Total			**24**

Phase 1c – Ultra-Rapid Charging Proposal

Location	Spaces	Charger Type	Charging Speed per Space
Green Lane Car Park	4	150kW Single Chargers	150kW
Ruislip Lido	4	150kW Dual Chargers	75kW
Devonshire Lodge	6	150kW Single Chargers	150kW
	14		

SELECT COMMITTEE RECOMMENDATIONS

From the review by the former Public Safety & Transport Select Committee during 2021/22, approved by Cabinet March 2022.

Short-Term Recommendations (for implementation in the next 6 – 12 months)

1) **That Cabinet seek to increase the transparency of information available on the Council's website relating to EV charging infrastructure projects and installations to residents.**

2) **That Cabinet seek to improve levels of engagement with residents through a mechanism to express their interest in local EV charging provision.**

3) **That Cabinet note the objectives of the Council's Strategic Climate Action Plan, with reference to sustainable transportation and the development of an EV charging action plan that will commit to increasing the availability of EV charge points across the Borough.**

4) **That a report be prepared for the relevant Select Committee on an annual basis regarding the implementation of the new EV charge point contract, usage and monitoring data from those newly installed charge points where possible, and the development of EV Infrastructure across the Borough as it progresses.**

Medium-Term Recommendations

5) **That Cabinet consider the merits of a more proactive enforcement effort to ensure developers make available suitable EV charging provision in their developments to fulfil their planning obligations.**

6) **That Cabinet explore the viability of a policy to ensure equitable use of on-street residential charge points and incorporate EV considerations into the design of future Parking Management Schemes, in advance of any future decision on the feasibility of introducing on-street EV charging points.**

7) **In support of the Council's Strategic Climate Action Plan, that Cabinet endorses plans to replace all diesel-powered vehicles 3.5T and smaller within the Council's fleet with EVs before 2030.**

Longer-Term Recommendations

8) **That Cabinet concurs with the Committee's findings that, whilst the Council is not wholly responsible at this time for directly providing EV infrastructure or the necessary utilities that support it, with such a societal paradigm shift, the Council should play a leading 'enabling' role to ensure that the Borough is working cooperatively with partners and is well prepared for the growing EV demand and the resultant technological, infrastructure and behavioural changes arising.**

9) **That Cabinet considers the Select Committee's long-term horizon findings from its review and the variables it has identified in how current and emerging EV technology and infrastructure may develop and change over time. This is so the Council can be both adaptive and responsive to future requirements and its residents - these have been set out in Annex A to these recommendations.**

ANNEX A – to Review Recommendations

For the Council to best serve its residents, and to effectively play its part in facilitating the transition from Internal Combustion Engine (ICE) Vehicles to Electric Vehicles (EVs), it must be both adaptive and responsive to future EV infrastructure requirements. The EV sector is changing rapidly, and emerging battery technologies, future developments and government policy could prove to overhaul the direction that the sector is moving. The Public Safety and Transport Select Committee specifically wish to highlight some of the long-term horizon findings from its review and the variables it has identified in how current and emerging EV technology and infrastructure may develop and change over time.

Emerging Technologies

Rapid Charging Hubs

With inevitable improvements in EV charging times, rapid charging hubs may form an integral part of the future charging network, especially for individuals who are unable to charge their EV at home. Taking much the same form as petrol stations, EV owners will be able to add a significant amount of charge within a relatively short time using rapid charging speeds. Rapid charging hubs have already sprung up at motorway service stations across the UK and it is likely that private companies currently operating petrol stations will seek to gradually transform some of their existing petrol stations into rapid charging hubs.

Solid State Batteries

Solid state batteries represent a paradigm shift in terms of battery technology. In today's lithium-ion batteries, ions move from one electrode to another across a liquid electrolyte. In solid state batteries, the liquid electrolyte is replaced by a solid compound vastly improving safety and sustainability. Solid electrolytes are non-flammable when heated, unlike their liquid counterparts. With regard to sustainability, solid state batteries permit the use of innovative, high-voltage high-capacity materials, enabling denser, lighter batteries with a better shelf-life. Although still in development at the scale required for EVs, solid state batteries can exhibit a high power-to-weight ratio and may be ideal for use in future EVs.

Hydrogen Fuel Cells

In simple terms, a hydrogen fuel cell vehicle uses hydrogen to power an electric motor. Hydrogen fuel cells have an energy to weight ratio ten times greater than lithium-ion batteries. This means that hydrogen powered vehicles have the potential to offer much greater range, while being lighter. Additionally, whereas lithium-ion batteries have a limited lifespan and need to be replaced, hydrogen fuel cells do not degrade in the same way. Further benefits to hydrogen powered EVs is that they can be refuelled in a similar manner to ICE vehicles, emulating the times currently experienced by traditional vehicle owners. There are a number of downsides to hydrogen fuel cell vehicles however, there are currently only two hydrogen fuel cell cars commercially available in the UK: the Hyundai Nexo and the Toyota Mirai. There are also only 11 publicly available hydrogen filling stations in the UK (5 being within Greater London). Additionally, it takes more energy to produce hydrogen than it does the electricity to charge a lithium-ion battery; this is a major barrier in the widespread proliferation of hydrogen fuel cell vehicles. If the production of hydrogen becomes more viable in future, it could have a significant impact on the EV industry, and the charging infrastructure required. Large commercial fleets, such as those operated by Transport for London are likely to be early adopters of hydrogen fuel cell vehicles.

Induction / In-road Charging

Although limited in its charging capacity, induction charging may offer a hassle-free alternative to cable charging. Charging plates are installed under the road or an individual's driveway which would then begin delivering a charge to an EV once it was appropriately positioned on top of it. It's uses are currently being applied in Oslo, Norway for a fleet of taxis to enable charging whilst they are stationed at a taxi rank. Albeit in very early stages of development, induction charging could evolve into a useful component of EV infrastructure.

Bi-directional Charging

For those able to charge their EV at home, bi-directional charging may play a huge part in future charging behaviours. Bi-directional charging can not only take power from the grid to charge the EV battery, but it can also supply power back to the grid, or power a home, using energy from the EV battery. Effectively it enables an EV to act as a home battery, storing energy that can be used to power a home or sold back to the grid.

Battery Swapping

By eliminating recharging times, battery swapping has emerged as a possible alternative to traditional EV charging. Battery swapping is a process by which an EVs depleted battery is changed, often at an automated battery swapping station, for a fully charged one. Whilst

theoretically seeming like an ideal solution to long EV charge times; there are a number of downsides to the implementation of battery swapping on a large scale. Namely that vehicle manufacturers are likely to be against standardising battery sizes to make them interchangeable at public battery swapping stations. Additionally, there would be logistical issues with ensuring a sufficient, fully charged stock of batteries at times of peak demand. There is, however, potential for battery swapping to be applied at scale for fleet vehicles with a shared depot such as delivery and transport companies. Whilst heavily dependent on the future development of more portable EV batteries, there is the possibility that future EV owners may have multiple batteries for their EV. One may be in use whilst the other is charging elsewhere, eliminating a large proportion of the need for public charging.

Future issues with current technologies

Many of the technologies utilised by the EV industry today may become obsolete in the mid to long term future as a result of future technological developments. This has the potential to fundamentally alter people's EV charging behaviours and the way in which EV infrastructure is laid out across the country.

Current Lithium-ion Batteries

The vast majority of today's EVs make use of lithium-ion battery technology, the same battery technology that has been used in mobile phones for a number of decades. Developments in lithium-ion battery technologies are expected to continue for the foreseeable future and will be set to improve range and charge times. However, many EV manufacturers are already looking to move away from some of the materials used in today's lithium-ion batteries such as cobalt; a material where current mining practices are often environmentally damaging and ethically unsound. Further to this, lithium-ion batteries that have come to the end of their usable life are notoriously difficult to recycle. Currently only around 5% of the worlds used lithium-ion batteries are recycled. Sodium-ion batteries have been touted as a possible future replacement for EV batteries utilising more abundantly available materials, however the use of sodium-ion batteries within the EV industry is in its infancy.

Charging Behaviours and Pavement Mounted Chargers

People's charging and refuelling behaviours are expected to change as the transition to EVs takes place and behavioural charging concepts such as 'destination charging' and 'grazing' grow in popularity, particularly for individuals without the facility to charge at home. Destination charging is utilising the charging infrastructure available at an individual's destination where they intend to stay for a number of hours, for example their workplace. Grazing is the concept of delivering a smaller amount of charge during shorter, frequent trips such as when using public car parks, supermarkets and leisure facilities. Whilst it will be important to facilitate the availability of on-street residential charging, concerns have been raised with regard to the potential addition of a high volume of pavement mounted EV charge points and the possible overloading of footways and pavements with street furniture.