



London Electric Vehicle Infrastructure Delivery Plan: One Year On

November 2020

Supported by

The Mayor's
Electric Vehicle
Infrastructure
Taskforce

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1. Introduction

In May 2018, the Mayor of London established the world's first Electric Vehicle (EV) Infrastructure Taskforce. It consisted of industry leaders from 16 organisations, from both the public and private sector, with the aim of unlocking barriers to expanding charging infrastructure and accelerating the switch to EVs in the capital. As a result of multiple workshops and stakeholder discussions on topics such as user needs, land and energy issues and financial models, the Taskforce published the London Electric Vehicle Infrastructure Delivery Plan in June 2019.

The key insights, findings and recommendations of the Taskforce were:

- Public charge points should be open to all, with a few exceptions, notably taxi drivers and other specific, priority groups
- Different types of chargers support different user needs and a mix of rapid and slower chargers will be needed to 2025
 - For rapid chargers, the focus is on rapid charging hubs¹ which primarily serve high-mileage/business users who require fast and available charging. The plan outlined the need for at least five flagship rapid hubs, one in each sub region of London, with the first by 2020
 - Additional rapid charge points are required to improve overall coverage of rapid charge points
 - For slower chargers, the focus is on uplifting volume, reducing the streetscape impact of charge points, maintaining accessibility of the pavement for pedestrians, and exploring new models around deployment off-street
- EV driver behaviour is evolving and lessons should be learned to avoid stranded assets

The Delivery Plan included modelled projections for the amount of infrastructure that would be needed in London to 2025 from both the public and private sector. Our latest data shows that London has already exceeded the levels of infrastructure that the Delivery Plan projected would be needed in 2020. We are leading in the UK with over 26 per cent of the country's charge point connectors in London² (as of November 2020) and we have one of the most extensive packages of policies supporting EV uptake across Europe.³ This is all the more impressive given significant challenges due to the stoppage of all construction works between March and July 2020 due to COVID-19 restrictions. By the end of 2020, TfL expects to deliver 300 rapid charge points, should no further delays be incurred due to the COVID-19 pandemic. The London boroughs are due to have installed 3,000 on-street residential charge points as part of the Go Ultra Low City Scheme (GULCS) by April 2021.

The COVID-19 pandemic, travel restrictions and social distancing have significantly changed the way people travel in London, as in the rest of the UK and cities around the world. When we begin to recover from this pandemic it is essential that we focus on a green and fair recovery. This includes a focus on sustainable transport, mode shift to walking, cycling and public transport, electrification for essential vehicle journeys, emissions reduction and investment in green industries at its heart. The EV revolution will be key to this, both in terms of supporting people and businesses to switch to EVs as well as green skills and job creation. This is a key part of the London recovery programme, including the Green New Deal mission being led by City Hall.

¹ Defined as 'a minimum of six rapid chargers enabling simultaneous charging of six or more vehicles'

² <https://www.zap-map.com/statistics/>

³ https://theicct.org/sites/default/files/publications/EV_city_policies_white_paper_fv_20200224.pdf

Alongside meeting World Health Organisation recommended limits for air pollution, the Mayor has also set out his ambition for London to be a zero carbon city by 2030. This, accelerates the ambition outlined in the Mayor's Transport Strategy for London to be zero carbon by 2050. This would mean more action at a faster rate would be required to decarbonise London's transport network and requires significant commitment, action and funding to deliver this from a wide range of stakeholders, including central government and the private sector. Whilst achieving significant mode shift remains the top priority, ensuring remaining road vehicles are zero emission is critical to achieving a zero carbon London.

The focus on improving air quality persists. This is especially important now as those with underlying respiratory conditions are more susceptible to COVID-19. Lockdown restrictions which led to less people travelling had a positive impact on air quality. In 2020, before measures to address the COVID-19 outbreak were introduced, hourly average levels of nitrogen dioxide at all monitoring sites in central London had already reduced by more than a third (35 per cent) compared to the same period in 2017. Since 16 March 2020, there has been an additional reduction of 27 per cent.⁴ However, as traffic levels return to normal, we must avoid lurching from one public health crisis to another, and we must continue tackling air pollution and improving air quality for all.

This report was originally planned for publication one year on from the launch of the London Electric Vehicle Infrastructure Delivery Plan, but this was delayed due to the pandemic. Now closer to 18 months on from the launch of the Delivery Plan, this report aims to showcase the progress made and outline the next steps and future plans for the EV agenda.

Alongside the development and publication of this report, we have reconvened the Taskforce members to explore new topics surrounding EV uptake and its associated infrastructure. It will explore the impact of COVID-19 and ensure alignment with London's recovery including the Green New Deal mission. This will support achieving the Mayor's 2030 targets for London to be zero carbon and to meet World Health Organization's PM2.5 guidelines. It is also important that London plays its role in ensuring the supply chain for electric vehicles is ethical and sustainable.

⁴<https://tfl.gov.uk/info-for/media/press-releases/2020/april/gla---dramatic-improvements-in-air-quality-on-london-s-ro>

2. Infrastructure delivery update

Key findings from the Delivery Plan showed that by 2020, the capital would need 200 to 400 rapid charge points and 3,400 to 4,700 slow to fast charge points. By 2025, this could rise to between 2,300 to 4,100 rapid charge points and 33,700 to 47,500 slow to fast charge points.

	EV Infrastructure Taskforce requirements for 2020 (Delivery Plan modelling)	Actual charge points in London (Zap-Map data, August 2020)	Requirements for 2025 (Delivery Plan modelling)
Total rapids	200-400	c.450	2,300-4,100
Total fast and slow	3,400-4,700	c.5,600	33,700 - 47,500

Table 1: Delivery Plan modelling of infrastructure requirements and current infrastructure availability in London according to ZapMap data

The latest data from Zap-Map shows that London now has more publicly available infrastructure than the Delivery Plan anticipated would be required in 2020. As of August 2020, Zap-Map's data shows that London has approximately 5,500 charge points in total, of which over 450 are rapid charge points. Figure 1 below shows the breakdown of all publicly available infrastructure by borough, including all charge points delivered by TfL and the London boroughs through GULCS Round 1.⁵

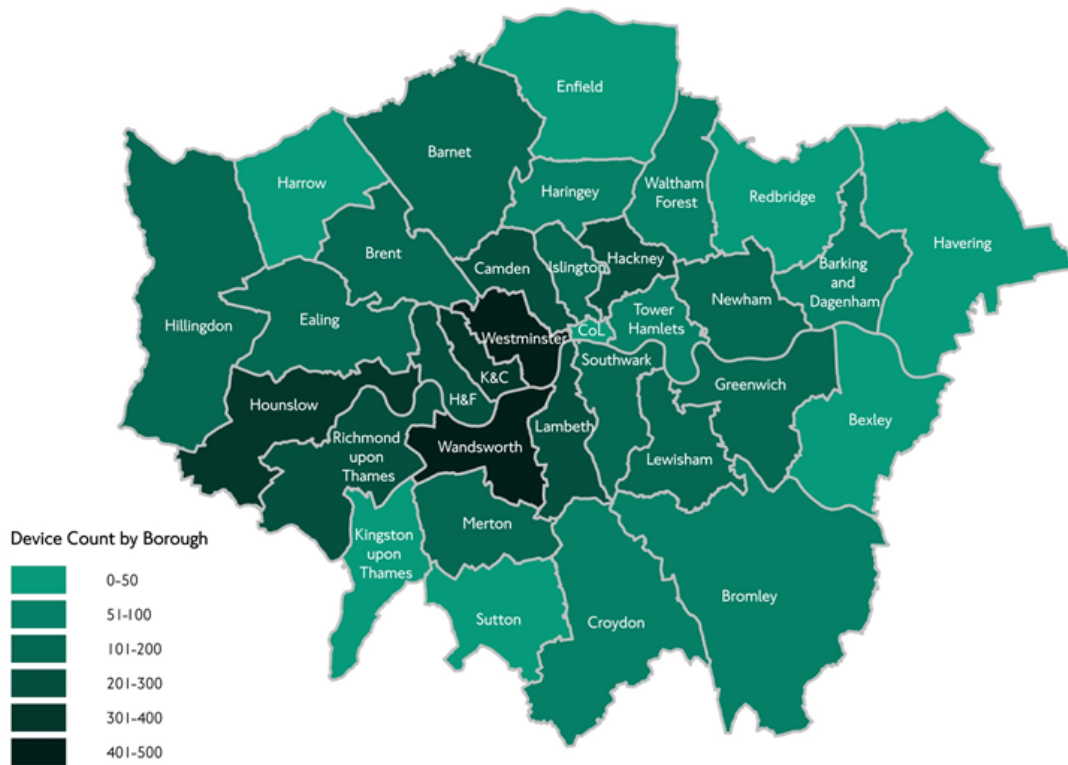


Figure 1. Number of electric vehicle charging devices per London borough (source: Zap-Map, 2020)

⁵ The London boroughs participating in GULCS Round 1 funding are: Barnet, Bexley, Brent, Camden, Croydon, Ealing, Greenwich, Hackney, Hammersmith and Fulham, Haringey, Harrow, Islington, Kensington and Chelsea, Lambeth, Lewisham, Newham, Redbridge, Richmond upon Thames, Southwark, Tower Hamlets, Waltham Forest, Wandsworth, Westminster

A key user of the new charge points across the capital are black taxis. Alongside the requirement that any new taxi being presented for license would need to be zero emission capable (ZEC) from January 2018, TfL committed to installing 300 rapid charge points by the end of 2020, using £17.8m of funding from the Office for Low Emission Vehicles (OLEV). As of October 2020, TfL has delivered 276 rapid charge points, of which 76 are dedicated to taxi-only use. Despite the disruption to works caused by the pandemic, TfL is still on track to deliver 300 rapid charge points by the end of the year.

London's first rapid hub was delivered in December 2019, in Stratford International carpark. It was jointly funded by TfL, HighSpeed 1 and Engenie. A total of six charge points were installed, contributing to the 276 rapid charge points across London.

The London GULCS programme is an OLEV-funded programme awarded £13.2m in 2016 to deliver a range of programmes to encourage ultra-low emission vehicle (ULEV) uptake. The scheme is managed by TfL, the Greater London Authority (GLA) and London Councils and has provided funding to the London boroughs and TfL to deliver on-street residential charge points, car club charge points, rapid charge points, community charging hubs and a range of innovative measures to encourage ULEV uptake through Neighbourhood of the Future⁶ (NoF) projects. More than £6.5m of the funding has been allocated to London boroughs for the delivery of on-street residential charge points. As of October 2020, as part of Round 1 funding, 2,054 on-street residential charge points had been delivered across the 23 boroughs that participated in the scheme. As part of Round 2 funding, the scheme aims to deliver more than 1,000 additional on-street residential charge points, two community charging hubs and 13 rapid charge points through the London boroughs by April 2021.⁷ The project is still on track.

The EV coordination body, managed by London Councils has also coordinated a pan-London bid to central government requesting £2.3m On-street Residential Chargepoint Scheme (ORCS) funding, submitted in August 2020. If granted, this will provide funding for the delivery of more than 700 slow and fast charge points across 14 boroughs by April 2021. These boroughs identified the need for more charging infrastructure and bid for more funding towards these. OLEV is awarding the funding on a borough by borough basis, and to date, £1.4m has now been allocated.

	Charge points delivered as of October 2020	Total expected delivery by TfL and London boroughs
Rapid charge points (TfL)	276 installed as of October 2020	300 by end 2020
On street residential charge points (GULCS)	2,054 installed as of September 2020	3,000 by April 2021

Table 2: Charge points delivered by TfL and Go Ultra Low City Scheme

2.1 Impact of COVID-19 on EV infrastructure delivery and usage

The COVID-19 pandemic and lockdown restrictions in London meant that all non-essential construction work, including the installation of charging infrastructure, was brought to a safe stop in late March 2020. Charge point installation work restarted in July, and since then we have been working hard to meet our targets. Despite the disruption to works caused by the pandemic, TfL is still on track to deliver 300 rapid charge points by the end of the year. Over 1,000 additional residential charge points are due to be delivered by the London boroughs, funded by the GULCS programme, by April 2021.

⁶ The 'Neighbourhood of the Future' project funds local authorities across London to support measures to increase electric vehicle uptake. Its aim is to find local solutions to break down barriers to electric vehicle uptake.

⁷ The London boroughs participating in GULCS Round 2 funding are: Barnet, Bexley, Brent, Camden, Croydon, Ealing, Enfield, Greenwich, Hackney, Hammersmith and Fulham, Harrow, Hounslow, Islington, Kensington and Chelsea, Kingston, Lambeth, Lewisham, Newham, Redbridge, Richmond upon Thames, Southwark, Sutton, Tower Hamlets, Waltham Forest, Wandsworth, Westminster.

The impact of COVID-19 on rapid charge point usage can be clearly seen in April 2020 where energy use declined versus the pre-lockdown period (Figure 2). However, a recovery pattern can be seen from June when travel restrictions were eased, and our latest statistics show that usage has returned to and, as of September, exceeds pre-lockdown levels.

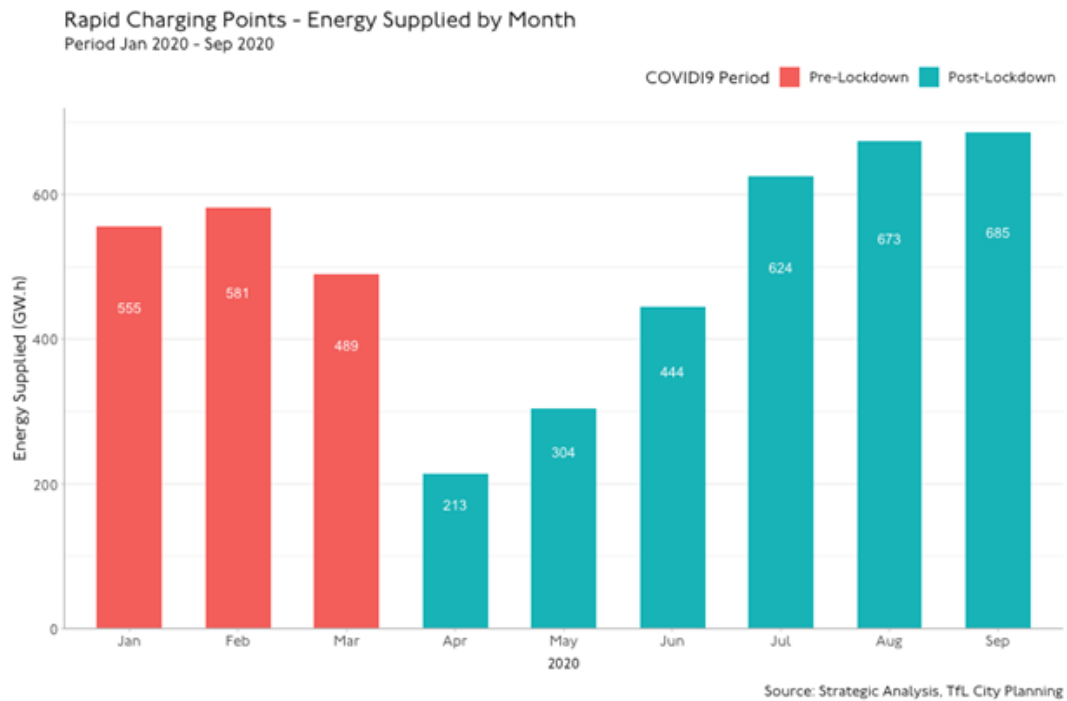


Figure 2: Energy use for rapid charging in pre- and post-COVID-19 lock down periods

3. Update on enablers

In a series of workshops conducted in 2018, the Taskforce identified three priority areas to unlock barriers to charge point installation. These are:

- To facilitate smoother installation and match supply with demand
- To reduce energy barriers
- To share knowledge and maximise potential of legislation

Under these three themes, eight enablers were identified. Significant progress has been made in the first year, with all enablers either complete or in progress. A summary of progress on the enablers can be found in Table 3. A detailed update on progress for each priority area and enabler can be found below.

Category	Enabler	Progress
Facilitate smoother installation and match supply with demand	1. Deliver London's first rapid charging hub and support the roll-out of additional rapid charging hubs – in collaboration with the private sector	First hub launched by TfL in December 2019, one more due in 2020
	2. Support shared business charging infrastructure	Ongoing
	3. New pan-London Co-ordination Body to facilitate and oversee charge point installation	Launched by London Councils in July 2020
Reduce energy barriers	4. New online tool/ 'heat mapping' to identify energy grid constraints and where new charging capacity will be cheaper and easier	Published by UKPN in June 2019
	5. Explore alternative and smart power supply options, such as battery storage, mobile charging and private wire networks	Published by Energy UK in October 2020
Share knowledge and maximise potential of legislation	6. Publish guidance on charge point installation for both public and private sector	Published by TfL in December 2019
	7. Publish guidance on future-proofing EV infrastructure to encourage investors	Published by BEAMA in March 2020
	8. Promote better standardisation of charge points and vehicles, interoperability of systems and data sharing	New charge point map launched by the GLA in June 2019 London Charge Point Operators Forum launched in November 2019, ongoing

Table 3: An update on each of the enablers identified in the Delivery Plan. Projects highlighted green indicate their completion and projects highlighted orange indicate that the project is still in progress

3.1 Facilitate smoother installation and match supply with demand

Enabler 1 – Deliver London’s first rapid charging hub and support the roll-out of additional hubs

The Taskforce identified the need for rapid hubs, which would offer at least six rapid charge points per hub. A hub offers ‘on-the-go’ charging and can increase customer confidence knowing that there are multiple charge points at a single site. These hubs would be typically located in town centres, one in each subregion of London, to serve the public but also commercial fleets (Figure 3). This approach is even more important in light of the pandemic and to support a green recovery, with the London Recovery Board working to revitalise high streets.

The first rapid hub, consisting of six rapid charge points, was delivered in December 2019, in Stratford International carpark (Figure 4).

Since opening, there have been over 1,200 charging sessions. It was jointly funded by TfL, HighSpeed 1 and Engenie. TfL is currently progressing with a further two hub sites at Baynard House, City of London, which will deliver six rapid charge points (two taxi-only and four publicly accessible) in 2020; and at Glass Yard, Greenwich, which will deliver eight rapid charge points in 2021 (one taxi-only and seven publicly accessible).

Due to COVID-19, work was paused for three months at both hub sites. TfL works at Baynard House are complete and are awaiting the completion of City of London works prior to the site opening to the public. This is due to be towards the end of 2020, should no further delays be incurred.

TfL is also working with other third parties to investigate opportunities to install EV infrastructure across London, including a hub with six rapid charge points at Asda, Park Royal. TfL continues to identify more locations and third party partners.

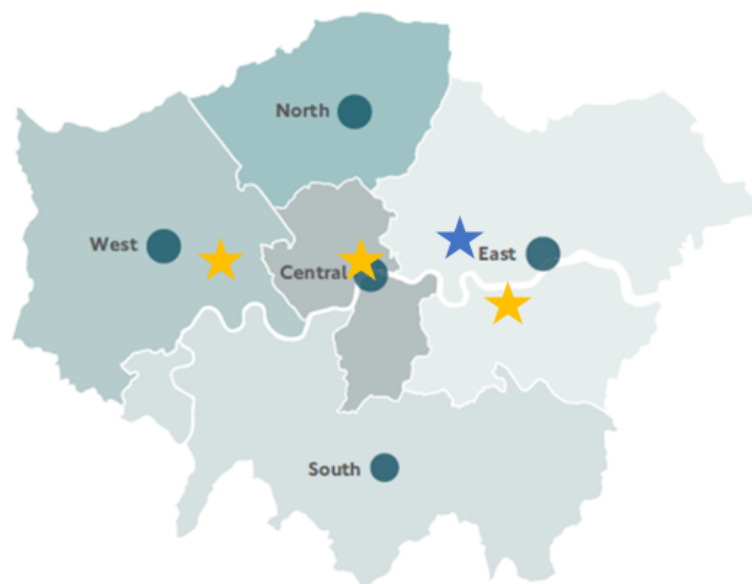


Figure 3. Map of London indicating planned and delivered rapid hubs by TfL. The blue circles indicate each sub-region of London; the blue star indicates a rapid hub delivered; the orange stars indicate rapid hubs planned.



Figure 4: London's first rapid charging hub in Stratford International carpark, opened in December 2019

Enabler 2 – Support shared business charging infrastructure

The Taskforce agreed that to increase utilisation and the number of available charge points in London, charge points installed by a public or private sector organisation could be opened up for shared use with agreed partners or for public access. TfL and the GLA have been working closely with businesses on opportunities to share charging infrastructure. Discussions are ongoing and several projects are underway:

- TfL has been in conversation with UPS to install charge points outside their site in Kentish Town, where the UPS fleet will be electrified. An opportunity has arisen where the vehicles are out on delivery during the day and charge points could be opened up as potential taxi-dedicated charge points. This is feasible due to the spare electrical power capacity available during the day while UPS' vehicles are out on delivery. Throughout 2019 and 2020, UPS have been undertaking site surveys and working with UK Power Networks (UKPN) to assess site feasibility.
- TfL is working with Old Oak and Park Royal Development Corporation (OPDC), Engie and Asda to investigate the installation of a rapid charging hub at Asda, Park Royal. These charge points would be available to the general public 24 hours a day and 7 days a week. Asda are keen to install charge points at other sites across London and the rest of the UK. Timescales indicate that the site will be available to the public by March 2021 should no delays be incurred.
- The GLA is investigating the viability for shared charging infrastructure across GLA Group fleets which includes TfL, London Fire Brigade and the Metropolitan Police Service. This would also support the Mayor's commitments to transition the GLA Group's fleet to zero emission vehicles.

Enabler 3 – New pan-London Coordination Body to facilitate and oversee charge point installation

Through the extensive consultation and information gathering of the Taskforce activity, the Taskforce identified strong support for setting up a pan-London coordination body to facilitate and oversee borough charge point installation. This body would provide a service that will save money, pool resources and ensure a consistent approach to public charging infrastructure across London. The EV coordination body, led by London Councils, and joint funded by London Councils and TfL, was launched in July 2020. Responsibilities include overseeing the delivery of GULCS, sharing knowledge, supporting borough delivery through the provision of procurement and contract management support, identifying and securing funding and partnership opportunities and collating and analysing charge point usage data to inform future delivery. Achievements of the coordination body so far include:

- Overseeing of the procurement of approximately 1,000 residential charge points through the GULCS programme
- The launch of a webpage⁸ for Londoners to suggest a location for the delivery of an on-street charge point near their home
- The coordination of a bid for over £2m of OLEV funding for boroughs to deliver more than 700 on-street residential charge points
- Development of an EV charge point analysis dashboard with the GLA which will be available to London boroughs in November. Access for other relevant stakeholders will be reviewed following assessment of how the dashboard has worked with boroughs

3.2 Reduce energy barriers

Enabler 4 – Develop a new online heat mapping tool to identify energy grid constraints

A common concern of many is that EVs will put too much strain on the power network and will cause the system to fail. However, the evidence provided by the National Grid and local distribution networks indicates that these concerns are either not material or can be mitigated with planning and introduction of a coordinated 'smart' response.

Distribution network operators (DNO) facilitate electricity supply connections to charge points. Each location for a charge point is investigated by the DNO, to check if there is enough electricity supply for the site. The concept of a heat mapping tool was identified to speed this process up and to avoid potentially unnecessary investigations. UKPN, the DNO responsible for the electricity network covering the majority of London, developed an online heat mapping tool (Figure 5).⁹ The map, launched in June 2019, shows where it is likely to be easiest to connect charge points on low voltage networks, meaning charge points can be installed more quickly and at a lower cost.

As of October 2020, the map has had over 1,000 views since being launched. Local authorities amongst other customers have valued UKPN's pre-application support, including the heatmap but also surgeries and feasibility studies to support infrastructure installation. As a package, this has allowed UKPN to identify the best sites for rapid charge points to make best use of the GULCS funding.

⁸ <https://www.londoncouncils.gov.uk/our-key-themes/transport/electric-vehicle-charging/suggest-location-ev-charge-point>

⁹ <https://innovation.ukpowernetworks.co.uk/2019/07/02/ev-connections/>

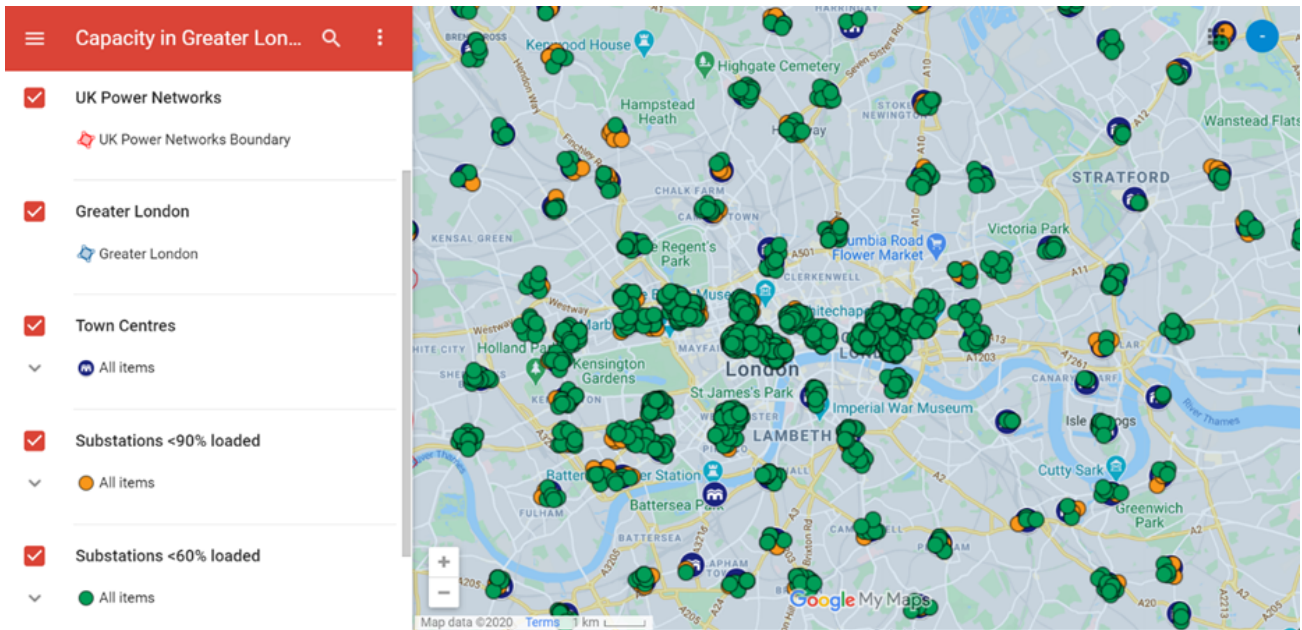


Figure 5: Online heat mapping tool created by UKPN, showing the capacity of local substations

Enabler 5 – Explore alternative and smart power supply options, such as battery storage, mobile charging and private wire networks

Connecting power to supply a new charge point sometimes comes with prohibitive costs to upgrade the grid and lengthy lead times. The Taskforce recommended that alternative opportunities such as private wire or energy storage should be investigated in order to provide guidance on how to make the process cheaper and easier for those upgrading their supply.

Energy UK, a Taskforce member and the trade association for the UK's energy industry, published a guidance document *Connecting your fleet: A guide for businesses in Greater London*¹⁰ along with Taskforce members, including UKPN, in October 2020. The guidance is aimed at businesses seeking to install charge points on their premises, but who are constrained by their power supply. It takes the reader step-by-step through the connection process and introduces alternatives to paying for an upgraded power supply, which can

reduce the cost and complexity of implementation.

Alternatives include optimising existing connections; load management; smart charging; on-site generation and battery storage; timed profile connections; and using a different substation. Best practice case studies illustrate these options in the guide.

¹⁰ <https://www.energy-uk.org.uk/publication.html?task=file.download&id=7673>

3.3 Share knowledge and maximise potential of legislation

Enabler 6 - Publish guidance on charge point installation for both the public and private sector

To ensure there is a consistent approach to charge point planning and installation design, the Taskforce wanted to collate the latest best practice design and provide an update to TfL's 2010 Guidance for implementation of electric vehicle charging infrastructure document.¹¹

TfL published London's electric vehicle charge point installation guidance¹² in December 2019. The guidance was developed in close collaboration with boroughs and other key stakeholders from government, the EV and energy sector and non-governmental organisations. This included running a series of workshops to gather ideas and input on the content of the guidance and a consultation on the draft guidance where stakeholder feedback was sought and incorporated into the final published guidance.



Figure 6: Lamp column charge point in London



Figure 7: An on-street charge point installed on a build out in the road in Haringey, London

The guidance outlines where infrastructure is best placed to meet the needs of EV users by collating the latest evidence in one place. It advises on how to identify current demand, provide for future uptake, site the right charge point in the right place, ensure infrastructure does not impact accessibility of the pavement, and ensure a good geographical spread. The guide has been disseminated to, and is being used by, local authorities across London. Examples of best practice design are shown in Figure 6 and 7.

Enabler 7 - Publish guidance on future-proofing EV infrastructure to encourage investors

As charge point technology develops at a fast pace, Taskforce members and stakeholders highlighted the concern of charge points becoming stranded assets. Taskforce member BEAMA published the document *Best Practice for Future Proofing EV Charging*¹³ in March 2020.

¹¹ [http://app.thco.co.uk/WLA/wt.nsf/Files/WTA-3/\\$FILE/EVCP-guidance-version-1-Apr10%5B1%5D.pdf](http://app.thco.co.uk/WLA/wt.nsf/Files/WTA-3/$FILE/EVCP-guidance-version-1-Apr10%5B1%5D.pdf)

¹² <http://truc.content.tfl.gov.uk/london-electric-vehicle-charge-point-installation-guidance-december-2019.pdf>

¹³ <https://www.beama.org.uk/resource-library/best-practice-for-future-proofing-electric-vehicle-infrastructure-.html>

The document focuses on guiding principles for the planning, design, manufacture and procurement of public EV charging infrastructure. The guide seeks to enable the growth of a sustainable market for EVs, enhancing stakeholders' knowledge and understanding of core concepts around the infrastructure-side elements involved in charging EVs, particularly on topics such as vehicle types, charging equipment, installation locations and market development.



Figure 8. BEAMA's best practice document, published in March 2020

It is designed to be used by manufacturers of public EV infrastructure, providers of services related to public EV charging, investors in EV infrastructure and planners at the local, regional and national level.

BEAMA identified three key principles for manufacturers, planners, asset owners, installers and operators considering how to 'future-proof' public EV charging infrastructure.

- **Resilience:** Adaptability, product longevity, and interoperability are all essential for consumer and investor confidence and to avoid stranded assets.

- **Suitability:** Behaviour is evolving, so to meet a variety of needs we need a variety of infrastructure models and appropriate planning, placement and installation.
- **Connectivity:** Data privacy and secure communications need to support the smart charging capabilities that are essential for network management.

Enabler 8 - Promote better standardisation of charge points and vehicles, interoperability of systems and data sharing

Discussions within the Taskforce workshops and engagement with key stakeholders identified common issues that people using charge points experience. These included the need for a national approach to mapping charge points, common payment platforms and interoperability, as well as standardisation of charge point connectors and cables.

As a result, the GLA set up the London Charge Point Operators Forum (LCPOF) in November 2019. The forum has met twice since its inception (November 2019 and February 2020) and intends to meet before the end of this year and quarterly once disruption from COVID-19 has eased. Operators have contributed to the BEAMA guide and informed the GLA and TfL's asks to government on behalf of London for EVs, including better standardisation of charge points and vehicles, interoperability of systems and data sharing.

To promote awareness and accessibility of charge points, the GLA also created a London charge point map which is available on the London Datastore (Figure 9).¹⁴ It shows the distribution of charge points open to the public and taxis across Greater London and within the M25, including those that have been delivered with support from the Mayor of London.

¹⁴ <https://maps.london.gov.uk/ev-chargepoints/?intcmp=52680>

Other charge point networks on the map are from char.gy, Chargemaster, ChargeYourCar, Ecotricity, ESB, GeniePoint, Pod Point, Shell and ubitricity.

The GLA, TfL and London Councils continue to lobby central government to decarbonise transport and to provide the right policy instruments and funding mechanisms to achieve this. In July of this year, TfL and the GLA submitted a joint response to the Department for Transport’s Decarbonising transport: Setting the challenge¹⁵ document and the Office for Low Emission Vehicles’ consultation to end the sales of petrol and diesel vehicles.

Some Taskforce members, including Energy UK and Logistics UK, also responded to these consultations.¹⁶

TfL and the GLA continue to ask central government for more funding towards charge point infrastructure in London including through a bid to the Treasury’s 2020 Comprehensive Spending Review.¹⁷

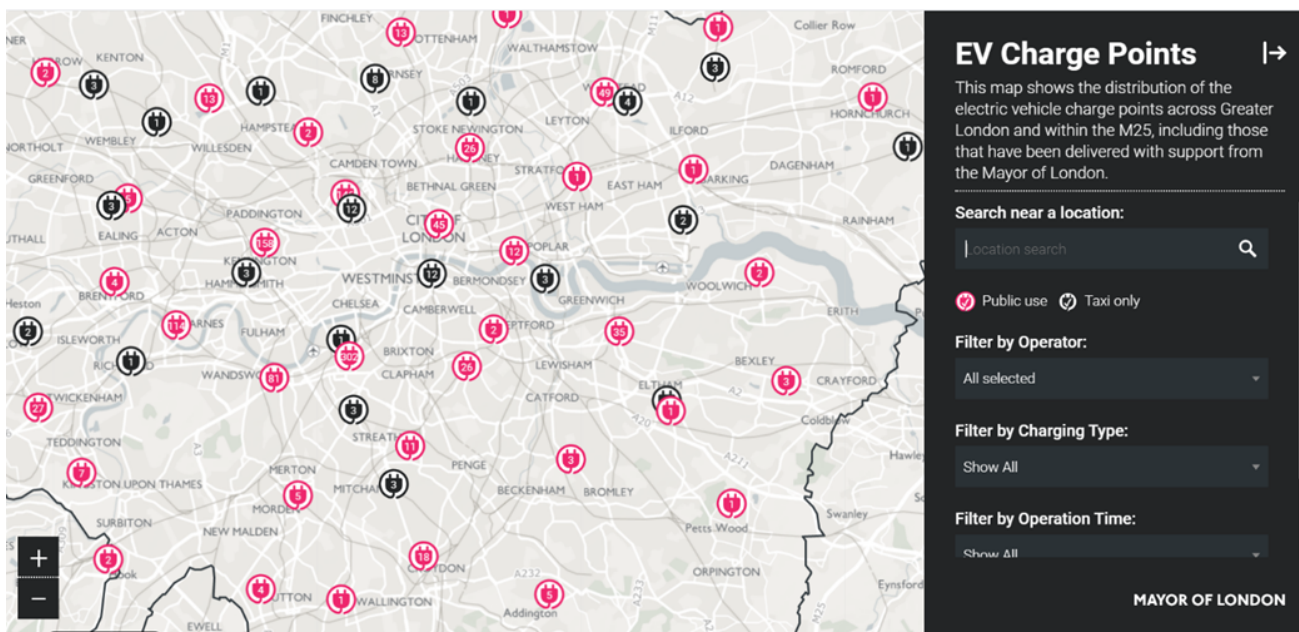


Figure 9: Electric vehicle charge point map created by the GLA

¹⁵ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/878642/decarbonising-transport-setting-the-challenge.pdf

¹⁶ <https://www.gov.uk/government/consultations/consulting-on-ending-the-sale-of-new-petrol-diesel-and-hybrid-cars-and-vans>

¹⁷ <http://content.tfl.gov.uk/fc-20200930-supp-agenda-public.pdf>

4. Charge point utilisation data and demand modelling

TfL and London Councils receive charge point utilisation data for rapid charge points delivered through TfL's rapid charge point programme and on-street residential points delivered through GULCS. We have been using this data to help us understand the current demand for charging infrastructure in London and to help us identify where more infrastructure might be needed. It is important to note that the usage of charge points depends on the number of EVs. Uptake of plug-in vehicle registrations in the capital are shown in Figure 10.

We are also in the process of updating our infrastructure demand modelling to take account of the COVID-19 pandemic and the Mayor's aspiration for London to become a zero carbon city by 2030.

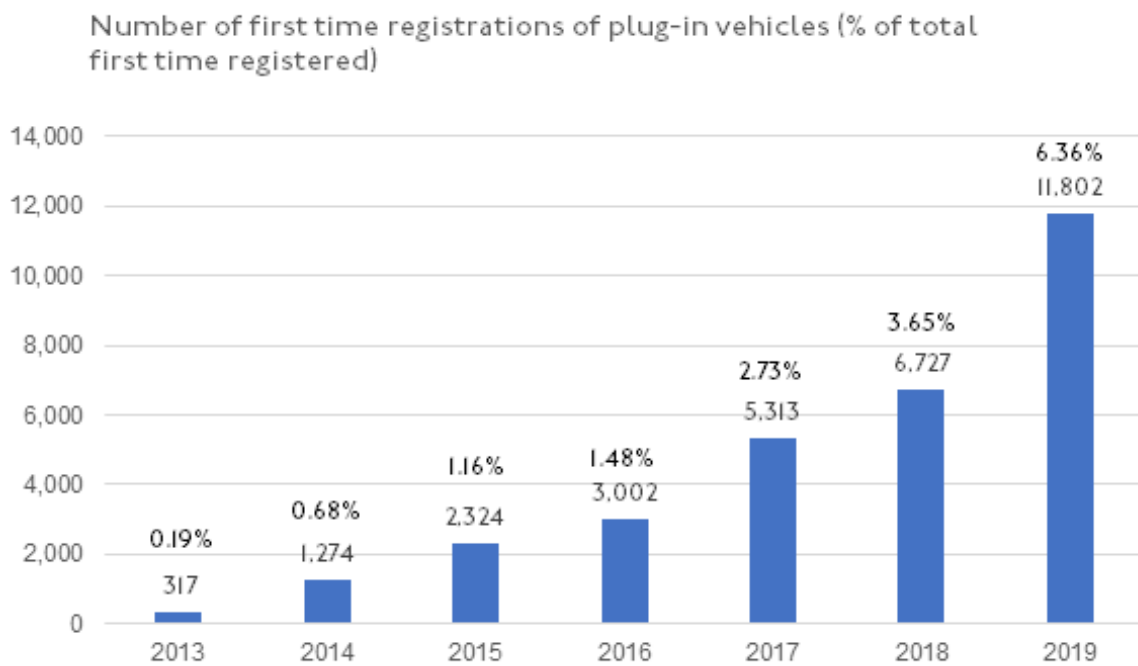


Figure 10: Plug in vehicles registered for the first time in London ¹⁸

¹⁸ DfT Statistics, Datasets VEH0254, VEH0354, VEH0454, VEH0131

4.1 Rapid charge point utilisation

TfL has undertaken a project to collate and analyse rapid charge point usage data. Utilisation data for usage between January and September 2020 from approximately 190 rapid charge points is included in the analysis to date. Data is for charge points that have been delivered by Chargemaster and ESB and which is reported to TfL. The charge points have a power output of up to 50kW. Key findings include:

- The most used rapid charge points are situated in central London (Figure 11). This area has multiple charge point locations, indicating that this area is the zone with the highest overall demand for rapid charging within London
- There is also a dense charging pattern in south-east London. However, there are relatively few rapid charge points in this area, suggesting that there may be additional demand for charging infrastructure in this area
- Most charging events last around an hour and deliver up to 25kWh
- Most charging events take place between 9am and 9pm, with relatively low usage between 1am and 7am. Charge points are used consistently across the working week, with slightly lower usage on weekends

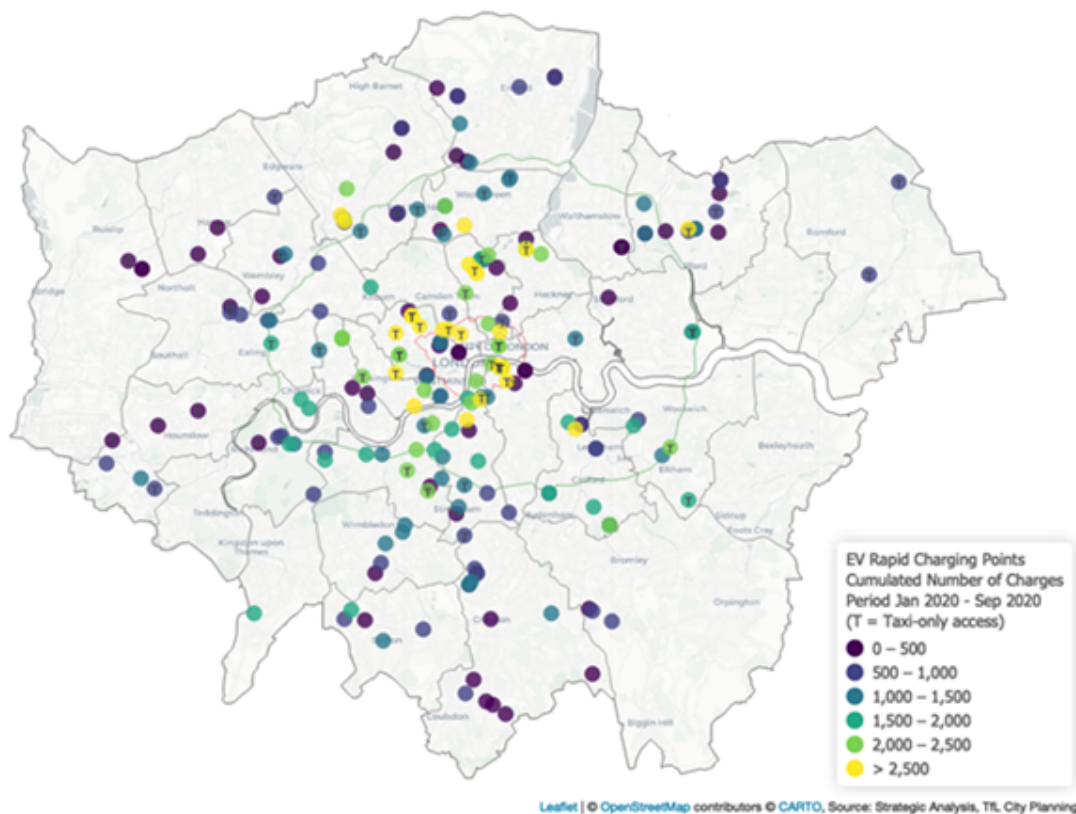


Figure 11: Map illustrating cumulative number of charges at TfL rapid charging sites between January and September 2020

4.2 GULCS charge point utilisation

The EV coordination body is leading on a project with the GLA to collate and analyse charge point usage data on the London Datastore. Utilisation data between October 2019 and June 2020 from approximately 1,800 charge points is included in the analysis to date. Data is for charge points that have been delivered on-street, in residential areas where residents have no access to off-street parking. They have a power output of up to 7kW and the majority have been delivered in or on lamp post columns. Key findings include:

- From October 2019 – February 2020 there was a steady rise in total number of charging sessions and total energy drawn in kWh each month. When lockdown restrictions were implemented in March there was a sharp decline in these numbers, starting to rise again when lockdown restrictions were eased in May 2020
- There is a fairly consistent utilisation rate of charge points across all boroughs. Boroughs that have a greater utilisation rate tend to have delivered more charge points
- The most popular time for users to plug in is between 5pm and 8pm and charging events are fairly evenly distributed from Monday to Friday. Saturdays and Sundays are slightly more popular
- The average plug-in time is considerably longer than the average charge time, which is consistent with the expectation that these charge points are used overnight, and therefore plugged in for longer than the time required to provide a full charge
- There are two peaks for the amount of energy provided for charging events. The first is at 6-8 kWh, with a sharp decline afterwards. This could be attributed to

plug-in hybrid vehicles with small battery capacities, or to the expectation that vehicles rarely charge from zero. There is a second peak at 23-25 kWh. This is likely to be attributed to fully electric vehicles with larger capacity batteries

4.3 Demand model update

Modelling undertaken as part of the Delivery Plan forecast the demand for EV charging in London under a number of scenarios. It predicted that by 2025, with EV uptake in line with the Mayor's Transport Strategy and the Zero Carbon London: A 1.5 degrees Celsius compatible plan,¹⁹ London may need between 2,300 to 4,100 rapid charge points and 33,700 to 47,500 slow to fast charge points. However, the medium to long term impact of COVID-19 on London's economy and travel patterns will need to be assessed and the original demand modelling updated. Early signs for the EV sector seem positive, with the latest figures from the Society of Motor Manufacturers and Traders (SMMT) showing that while vehicle sales have fallen overall, in the year to August 2020 battery EVs were the fastest growing sector of new vehicle sales.²⁰

In addition, since the Delivery Plan was published the Mayor has stated his ambition for London to be a zero carbon city by 2030, and the government propose to phase out petrol and diesel internal combustion engine vehicles by 2035. These could dramatically affect the speed with which EVs are adopted in London, and therefore the infrastructure required to charge them.

TfL will undertake a sensitivity review of the demand model and its evidence base to take account of the impacts of COVID-19 and the proposed future targets for carbon dioxide by 2030.

¹⁹ https://www.london.gov.uk/sites/default/files/1.5_action_plan_amended.pdf

²⁰ <https://www.smmt.co.uk/2020/09/august-ev-registrations-3/>

This will generate a range of future EV scenarios for 2025 that better account for different levels of active travel, economic recovery and battery efficiency. From this we hope to grow our understanding of the scale of intervention needed to support further uptake of EVs for London.

demographic and transport characteristics – this difference is particularly pronounced between inner and outer London boroughs, which aligns with the Delivery Plan.

4.4 International Council on Clean Transportation report

The International Council on Clean Transportation (ICCT) has undertaken analysis on the charging infrastructure needed to fulfil London's electrification goals up until 2035. It builds on the work undertaken for the Delivery Plan by looking at London's infrastructure needs at a borough level. It also expands the timeframe of the Delivery Plan to look at EV charging infrastructure needs up until 2035. The analysis will be used by the Taskforce to inform GLA and TfL modelling and future EV infrastructure planning in London.

The ICCT Report will be published at the same time as this One Year On report, and its key findings include:

- London will need significantly more charge points by 2030 in order to achieve the targets set by the Mayor, with high mileage fleets driving charging demand in the shorter term
- By 2025, there will need to be a more even distribution of charge points across London, with more infrastructure needed especially in East and South London
 - This echoes some of the findings from the analysis of rapid charge point utilisation, which suggests there may be additional demand for rapid charge points in South East London (see section 4.1)
- Different charging combinations are required to suit the diverse needs of boroughs depending on housing types, the

5. Progress on wider initiatives

In addition to progress on the enablers and commitments in the Delivery Plan, many other projects are underway in London, some of which are highlighted in the following section.

5.1 Electrification of buses

As of November 2020, there are 233 zero emission (electric) single deck buses and 145 zero emission (electric) double deck buses, totalling to 378 zero emission buses operating in London. This saved London 2,065 tonnes of carbon dioxide emissions in 2019/20. We currently have the biggest zero emission bus fleet in the UK and one of the largest in Europe, which includes both electric and hydrogen vehicles. An additional 150 zero emission (electric) buses are on order, and by Spring 2021 there will be over 500 zero emission buses in the fleet and power in 20 bus garages. We aim to have 2,000 zero emission buses in service by March 2025 and our current commitment is to achieve a zero emission bus fleet no later than 2037. We are exploring how we can accelerate this.

5.2 Zero emission capable and electric taxis

We are providing unprecedented support to the taxi industry to help them transition to zero emission capable taxis as well as delicense older, more polluting taxis. At the end of October 2020, London has over 3,800 zero emission capable taxis, the majority of which are the LEVC TX model, but also including 64 full electric Nissan Dynamos. To date, 76 rapid charge points are dedicated to taxi-use only. To accelerate the uptake of zero emission capable taxis, taxi drivers can get up to £7,500 towards a zero emission capable taxi via the plug in vehicle grant which is part funded by TfL. In addition, a £42m funding pot has been established to support vehicle owners who want to delicense their older taxis. These things alone would not be enough to achieve the necessary emissions reductions London needs, so in June 2019, TfL announced changes to its age taxi age limits policy. The new licensing arrangement is that each year in November the age limit of Euro 3, 4 and 5 diesel taxis will be reduced by one year, so that by November 2022 the maximum age limit to license a taxi will be 12 years. Under current policies we expect full transition to zero emission capable taxis and PHVs by 2033.



Figure 12: An electric bus in London

5.3 GLA Group fleet electrification

The Mayor’s Transport Strategy (MTS) sets out a commitment for all GLA Group fleets (TfL, the London Fire Brigade and the Metropolitan Police Service) to meet the following commitments:

- All cars in support fleets must be zero emission capable by 2025
- All new cars and vans (less than 3.5 tonnes), including response vehicles, must be zero emission capable from 2025
- All heavy vehicles (greater than 3.5 tonnes) must be fossil fuel-free from 2030

Table 4 below summarises the actions that GLA Group are taking to meet these commitments.

Functional Body	Progress to date
Transport for London	TfL is investigating the electrification of the TfL support fleet including switching to hybrid and zero emission vehicles, and implementing charging infrastructure to support this.
London Fire Brigade (LFB)	LFB is exploring options to switch their fleet to hybrid and zero emission cars and vans. Through the Zero Emission Pumping Appliance (ZEPA) project, LFB is running a focused investigation on zero emission options for heavy vehicle pumping appliances and supporting charging infrastructure, to help fulfil the Mayor’s fossil-fuel free 2030 commitment.
Metropolitan Police Service (MPS)	MPS has the largest car fleet of the GLA Group fleets which has encouraged the MPS to prioritise switching their cars to zero emission capable and are working on implementing charge points on the MPS estate to support the Mayor’s 2025 commitment.
London Legacy Development Corporation	LLDC’s fleet is made up of two electric mobility buggies, which are converted golf carts. LLDC is also implementing charge points on LLDC land for public and private use.

Table 4. Progress on electrification of GLA Group fleets

5.4 EU and Innovate UK funded projects

TfL is participating in a series of EU and Innovate UK funded projects relating to electric vehicles that contribute to delivering a number of Mayoral aims and objectives:

- For London to be a zero emission city by 2050 with clean transport and clean energy
- To develop clean and smart, integrated energy systems utilising local and renewable energy resources
- To investigate the potential for demonstrators where Londoners can help manage London’s energy demand
- To undertake demonstration projects to improve London’s energy systems

TfL is involved in the project E-flex, funded by Innovate UK in September 2018, which looks at how vehicle-to-grid technology (V2G), EVs and energy services can be used by fleet owners and operators to cut energy bills and reduce energy use.

Another project, Wireless Charging of Electric Taxis (WiCET), began in June 2020 to investigate the financial, operational and technical benefits of wireless charging technology for Hackney Carriage taxis. TfL is working on developing the case for city-wide scale up of inductive charging focusing on interoperability. TfL will work closely with Nottingham City Council who are a partner in the project and will be running a demonstration of inductive charging.

5.5 Wider Taskforce progress

Beyond the eight enablers, other Taskforce members have made strides to move the EV agenda forward in London. Progress can be found in Table 5.

Taskforce member	Progress to date
Federation of Small Businesses (FSB)	<p>FSB London continues to support the messaging and promotion of the Mayor’s scrappage scheme for businesses, to help drive the uptake of EVs across London.</p> <p>FSB London regularly communicates EV opportunities via its weekly e-newsletter to members and to the wider small business community via social media and the many virtual networking events that are organised across the London boroughs.</p>
London First	<p>In September 2020, London First reported on the findings on the London Data Commission. The Commission brought together business leaders, key figures in the governments of both the UK and London, as well as third-sector representatives, economists and data experts, to explore how to improve public-private data sharing. From the outset, the Commission focused on the key challenges facing London where sharing of currently available data could make a positive contribution and launched a series of data sharing pilots.</p> <p>One of these pilots looked at the impact of public-private data sharing on unlocking EV charging market constraints. The pilot, involving the GLA, London Councils, BP and UKPN, identified over 2,000 publicly owned parcels of land in London that matched the suggested land size and likely power capacity requirements for charging hubs. These were evaluated based on proximity to popular traffic routes and remoteness from existing charge points and a series of heatmaps produced. More details about the pilot are available on the London First website.</p>
Shell UK	<p>Shell intends to extend its EV charging service, Recharge, to cover over 50 Shell forecourts in the Greater London area by the end of 2020, as part of a wider national roll out. This will include a mixture of 50kW and 150kW charge points, with 150kW charge points becoming a new standard across the network. Beyond this, Shell plans to further increase its network of charge points in and around London with over 200 Shell Recharge charge points in total across the UK by the end of 2021.</p> <p>Shell also plans to convert a central London conventional fuel service station into an EV charging hub that will feature 10 high powered, 150kW charge points. This site will remove all conventional fuels pumps at the station to make way for high-speed EV charge points. The design of the site will focus around sustainable energy generation including solar panels. To ensure that customers can use the time they spend charging more effectively, this forecourt will also offer a new, on-the-go charging experience including a seating area for waiting EV drivers and a more extensive shop offer. Planning permission was submitted for the site in November 2019.</p>
SSE Enterprise	<p>SSE Enterprise is delivering innovative EV infrastructure solutions that can support a faster transition to EVs in London, with the potential to meet around 10 per cent of the capital’s required capacity. Working with major partners, SSE Enterprise is transforming existing under-utilised lock up garages into modern, ultra-rapid hubs, delivering the needed infrastructure to enable residents and commercial vehicles to shift to EVs.</p> <p>Each hub will have up to 20 ultra-rapid charge points and could potentially be upgraded with distributed energy generation technology such as solar PV and battery storage to help ease pressure on the grid, if necessary. The charging sites can also become digital community hubs, combining ultra-rapid charging with 5G and Edge computing technology. The first pilot projects will be ready for 2021.</p>
UKPN and SSE involvement in Optimise Prime	<p>The project launched to trial commercial EVs and involves Hitachi Vantara, UKPN, Centrica, Uber, Scottish and SSE, Hitachi Europe and Hitachi Capital Vehicle Solutions.</p> <p>To date, Royal Mail have 190 new EVs in their fleet and charge points have been installed at seven Royal Mail depots. UKPN has carried out connection and network planning assessments for 20 Royal Mail depots.²¹</p> <p>Centrica ordered 1,000 new electric Vivaro-e vans from Vauxhall – the largest commercial battery EV order in the UK to date. The vehicles will arrive over the next 12 months and be rolled out nationwide across the British Gas engineer workforce.²²</p> <p>UPS announced a commitment to purchase 10,000 purpose-built EVs from start-up EV manufacturer Arrival, with priority access to purchase additional EVs.</p> <p>In 2019 alone, Uber drivers in London completed more than one million journeys in EVs.²³</p>

Table 5. Wider progress made by Taskforce members on electric vehicles

²¹ https://innovation.ukpowernetworks.co.uk/wp-content/uploads/2020/06/OP_PPR_June2020-v1.0.pdf

²² <https://www.centrica.com/media-centre/news/2020/british-gas-makes-largest-uk-commercial-ev-order-with-vauxhall/>

²³ <https://www.uber.com/en-GB/newsroom/driving-a-green-recovery/>

6. Conclusions and next steps

Nearly 18 months on from the publication of the London Electric Vehicle Infrastructure Delivery Plan, we have seen the successful delivery of the infrastructure London needs in line with the demand estimates in the Delivery Plan. The utilisation data summarised in this report shows that this infrastructure is meeting the needs of EV drivers in London in real life. We have also achieved seven out of the eight enablers identified in the Delivery Plan, with work continuing to deliver the final enabler around shared infrastructure.

However, this is just the first step. The EV market is developing at pace while the impacts of the COVID-19 pandemic continue to cast unprecedented uncertainty on how people will travel in London. Despite this, more people are shifting to EVs²⁴ for a variety of reasons including concerns about air quality and climate change. In order to ensure that our work to date continues to have maximum impact, it is essential that we continue to work together to make progress in growing a future-proof charging network, in a cost-effective way, without creating stranded assets. TfL and local authorities will continue this work through the EV coordination body and by updating our infrastructure demand modelling to take account of the latest developments in the market. We will also continue to work with the private sector to maximise opportunities for the delivery of charging infrastructure without financial support from the public sector. TfL and London Councils work closely with charge point operators and are finding new ways for operators to work with boroughs, including through the London Charge Point Operators Forum. This will help to ensure that future infrastructure supports wider EV uptake across the city.

In 2021, GULCS is expected to deliver additional on-street residential charge points,

bringing the total delivered by the scheme to 3,000. TfL's plans to tighten the London Low Emission Zone and expand the Ultra Low Emission Zone will deliver further reductions in emissions across London, improve local air quality and encourage the uptake of EVs. TfL and the GLA have set out their plans for the next thirty years to enable London to meet its emissions reductions goals as per the Mayor's Transport Strategy, the London Environment Strategy and the Zero Carbon London: A 1.5 degrees Celsius Compatible Plan. However, this work needs to be accelerated so London can be zero carbon earlier. TfL, the GLA and London Councils continue to look to government for financial support to deliver charging infrastructure. This is especially important in order to help support a green recovery and the Mayor's ambition to be a zero carbon city by 2030.

The private sector is also making substantial efforts to drive the uptake of EVs and deliver the required infrastructure. However, in order to continue to support the delivery charging infrastructure beyond 2021, the Taskforce needs to come together again. It will explore the impact of COVID-19 and ensure alignment with London's recovery including the Green New Deal mission. This will support achieving the Mayor's 2030 targets for London to be zero carbon and to meet World Health Organization's PM2.5 guidelines. It is also important that London plays its role in ensuring the supply chain for electric vehicles is ethical and sustainable. For this reason, we have reconvened the Taskforce members alongside the publication of this report to investigate how we can continue to work together to meet our shared goal of accelerating EV uptake. We plan to work together over the coming months to explore and agree next steps for EV charging infrastructure.

²⁴<https://www.smmmt.co.uk/vehicle-data/evs-and-afvs-registrations/>

7. Appendix 1- Taskforce Members

At the launch event on 31 May 2018, the Mayor of London invited industry leaders from 16 organisations to join the EV Infrastructure Taskforce, chaired by the Deputy Mayor for Environment and Energy, Shirley Rodrigues. Below is the list of organisations that are part of the original Taskforce, which published the London EV Infrastructure Delivery Plan in June 2019.

- British Electrotechnical and Allied Manufacturers' Association (BEAMA)
- British Retail Consortium (BRC)
- Cross River Partnership
- Energy UK
- Federation of Small Businesses (FSB)
- Logistics UK (the new name for the Freight Transport Association)
- London Councils
- London First
- Mayor of London
- Office for Low Emission Vehicles (OLEV)
- Ofgem
- Royal Automobile Club (RAC) Foundation
- Royal Institution of Chartered Surveyors (RICS)
- Society for Motor Manufacturers and Traders (SMMT)
- Shell UK
- Scottish and Southern Energy (SSE) Enterprise
- Transport for London (TfL)
- UK Power Networks (UKPN)

