

TOWER HAMLETS

Charging Forward

Tower Hamlets electric vehicle
delivery plan: 2021-2025



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Foreword

In March 2019 the council declared a climate emergency. This commits the council to becoming a net a net zero carbon council by 2025 and a net zero carbon borough by 2050 or sooner. Reducing emissions from transport will be a key part of our achieving our carbon reduction commitments. Furthermore, Tower Hamlets has the fifth highest level of air pollution in London and around 40% of our residents live in areas that breach EU and government guidance on safe levels of air pollution.

The swift transition to electric vehicles will be one of the most important actions to achieve our Net Zero and air quality objectives. Since 2018 we have installed 23 fast charging points and over 80 slow charging points on street lighting columns. But the data shows us that we need to do more if we are to achieve a meaningful switch to electric vehicles over the next four years and beyond.

This delivery plan sets out our plan to encourage the switch through developing new charging facilities for electric vehicles, promoting their benefits to a wider audience and steps we can take to reduce the cost of owning an electric vehicle in the borough.

We are pleased to present this electric vehicle delivery plan.

1. Our approach in this delivery plan

This delivery plan sets out our approach to facilitating the switch to electric vehicles for those who drive from, to and through our borough. There are three main strands to our approach in this delivery plan:

- Increasing the number of charging points
- Reducing the cost of charging points
- Improving information for our residents and businesses

Increasing the number of charging points

Accelerating the switch to electric vehicles will require potential users to feel confident that there is an adequate number charging points to meet their needs, that these will be conveniently located and will be available when needed.

To date, the majority of those in the UK who already have electric vehicles charge off-street. For residents with access to their own private parking, this need can be met by charging from home where overnight charging is a convenient and low-cost option. However, for many businesses and residents in London, this is not an option. An estimated 93% of all households in Tower Hamlets do not have access to off-street parking¹. Therefore, access to nearby and reliable public charging is essential if we are to ensure the switch to electric vehicles in the borough.

Reducing the cost of charging points

We will work to ensure fairer costs of charging for the 93% of homes in Tower Hamlets that do not have access to their own off-street parking. The cost of charging a standard 40kw electric vehicle from using a public charger can be much higher than it is for a home charger. It is therefore important that we minimise this disparity in charging costs and work to ensure fairer pricing for

public charging. We will set out in this delivery plan how we will prioritise value for the end user for new charging points installed in the Borough.

Improving information for our residents and businesses

Despite the recent growth of electric vehicles, they are still a relatively new concept to many of our residents and businesses. Many of the electric vehicles that currently exist in the borough can be attributed to early adopters, but many are still unaware or are just learning about the advantages of electric vehicles and misconceptions are still common.

Residents and business will need help to understand the key differences between owning an electric vehicle and conventional petrol or diesel vehicle. As well as providing charging infrastructure we will develop a new electric vehicle online portal which will provide information including:

- The costs of owning and running an electric vehicle
- Different charging options
- Availability of local charging points



¹ <https://onstreetcharging.acceleratedinsightplatform.com/>

The challenge

Achieving net zero carbon emissions

In March 2019, Tower Hamlets Council declared a climate emergency. The council's net zero carbon action plan sets out our goals and commitment to tackling the climate emergency. Transport is now the highest greenhouse gas emitting sector of the UK economy¹, accounting for 21% of emissions.

The swift transition to electric vehicles will be one of the most important actions to achieve the council's net zero targets. Electric vehicles use 80-90% less energy than those powered by fossil fuels, due to the efficiency of electric motors and their ability to brake regeneratively.

A typical electric vehicle charged in the UK currently produces around 32-43g CO₂ per km; for a typical electric car this would reduce to just 13-17g CO₂ per km by 2030 and 4-5g CO₂ per km by 2050, thanks to the further decarbonisation of electricity. This compares to an EU average of 121g CO₂ per km for petrol and diesel cars sold in 2018.

Local air pollution from transport

Road transport is a major source of air pollution that harms human health and the environment. Vehicles emit a range of pollutants including nitrogen oxides (NO_x) and particulate matter (PM). With 40% of our residents living in areas with unacceptable air quality.

NO₂:

Concentrations are highest west of the borough closest to the City, with a large area exceeding the NO₂ annual objective, and along and around the main roads across the rest of the borough, with areas such as Limehouse and Poplar exceeding the annual objective. The lowest concentrations are in the south of the borough on the Isle of Dogs.

PM₁₀:

The highest concentrations and exceedances being along all the main roads through the borough.

PM_{2.5}:

The highest concentrations are shown in the western edge of the borough and along the main roads running through the borough

Coordinating our approach with our wider transport policies

A key element to achieving our zero carbon and air quality objectives is to incentivise a change to walking, cycling and public transport so less people feel the need to drive. Our strategic transport objectives are guided the borough's transport strategy and third local implementation plan.

Both documents set out policies to prioritise walking, cycling and public transport use over private vehicle trips. Our local implementation plan specifically sets out a target to reduce the number of cars owned from 50,000 in 2021 to 36,000 in 2041. But there are many trips that will still need to be carried out by car and we will need to ensure that emissions from these are minimised.

² <https://www.theccc.org.uk/wp-content/uploads/2020/12/The-UKs-transition-to-electric-vehicles.pdf>

The challenge

Meeting the needs of the growth of electric vehicles in the borough

As of June 2021, Tower Hamlets has 23 fast charging points and 98 lamp column slow charging points. There are also two rapid charging points installed by Transport for London as part of London network of 300 rapid chargers.

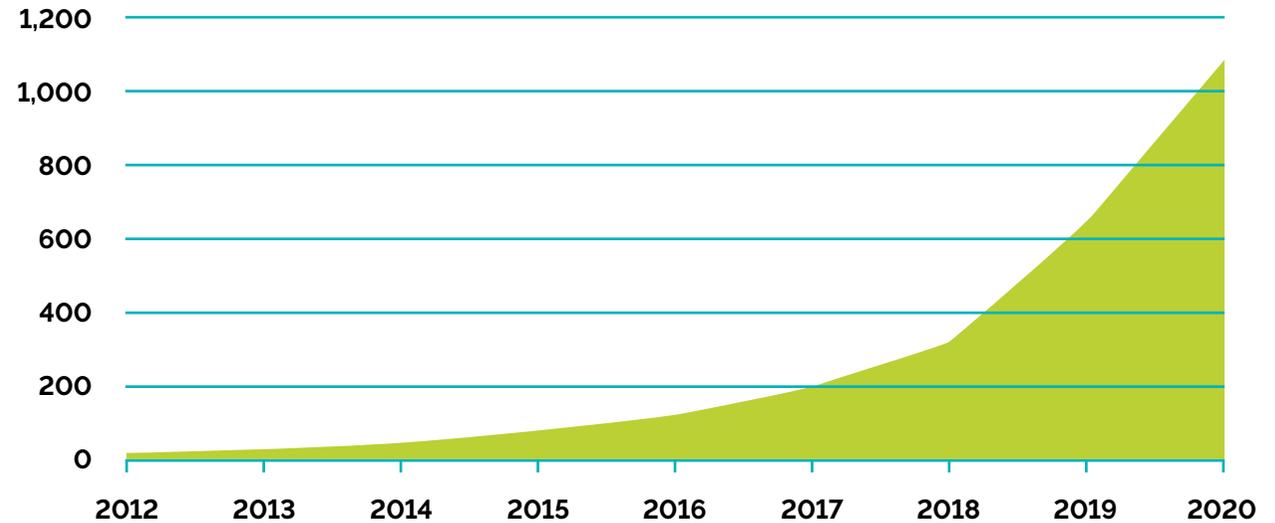
By mid-2020, Tower Hamlets had 1091 plug-in cars and light goods vehicles, an increase of 66% from the previous year which is the 3rd highest growth rate in inner London and higher than the growth rate for London which was just under 51%.

This significant growth of electric vehicles is despite the modest provision of public charging points being available on street, which is often cited as a barrier to adoption. A new and improved charging network in the borough will further accelerate electric vehicle adoption.

Access to off street parking

The lack of access to off-street parking is a key indicator for assessing the need of public charging infrastructure. In Tower Hamlets 65% of residents do not have access to a charging point within 5 minutes' walk, which is the 4th highest in Inner London³.

Total EVs registered in Tower Hamlets



66%

annual growth in electric vehicle registrations - the third highest in inner London



1300

plug in vehicles registered in the borough in 2021



93%

of households in Tower Hamlets have no access to off street parking - the highest in London



2700

vehicles per square km - the seventh highest in London



65%

of households are more than 5 minutes walk from the nearest Charger - the fourth highest in inner London

³ <https://onstreetcharging.acceleratedinsightplatform.com>

The challenge

Taxi and PHV (private hire vehicles) in Tower Hamlets

London has a growing fleet of zero emission-capable taxis and private hire vehicles and this is certain to have implications for the demand of charging infrastructure. In 2018 a requirement was put in place for all new taxi registrations in London to be zero emission capable and in 2020 all new (under 18 months old) PHVs licensed for the first time to also be zero emission. The largest PHV fleet is Uber, which has stated an ambition for 20,000 of its drivers to switch to EVs by the end of 2021, and 100 per cent of its drivers to have done so by the end of 2025.

Electric taxis and PHVs will have a significantly higher demand for charging points and this will have an impact on demand in boroughs such as Tower Hamlets that have high concentrations of both taxis and PHVs. For Tower Hamlets we will need to consider overnight charging demand for taxi and PHV drivers who live in the borough with no access to off street parking. This will inform suitable locations for destination/rapid charger for their operation during the day.

Fleet vehicles

A recent study⁴ suggested that the electric vehicle market can be divided into two groups of consumers; 'BuyBy' who are those who purchase vehicles for their own use and 'BuyFor' who are those whose vehicles have been purchased for them as part of a fleet (BuyFor). The EV market so far has been dominated by the BuyBys, but market changes mean that it is likely that the next phase of growth will be dominated by the BuyFors. This equates to a significant increase in electric vehicle buying potential with 56% of annual new car sales are purchased by fleets¹.

This will impact significantly on public charging point demand as a BuyBy driver has the opportunity to assess whether owning an electric vehicle can be facilitated given their charging options. For BuyFor drivers, they will need that vehicle, suitably charged, as a core tool to fulfil their job.

Electrifying the council's own fleet

As part of our commitment to be a net zero council by 2025, we will need increase the proportion of our fleet that is made up of electric vehicles. This new fleet will require a mix of onsite depot charging and public charging to facilitate operations. Our new charging network will therefore be developed to support the electrification of our fleet.

Car clubs

There are multiple car club operators who the council supports as an alternative to car ownership for residents. Data shows that when people use car clubs, it can encourage them to give up their cars and reduce their overall miles driven. All car club operators have an aspiration to switch to full electric vehicle fleets and available public charging points can facilitate that switch. We will therefore work with all the car club providers operating in the borough to ensure their aspirations are supported by our electric vehicles charging network.

⁴ http://www.field-dynamics.co.uk/wp-content/uploads/2020/09/On-Street-Households_The-next-EV-Challenge-and-Opportunity-1.pdf

Planning a network for 2025

In order to maximise the switch to electric vehicles we need to develop a public charging network that works for our residents and businesses. This involves determining how many charging points are needed and providing the right charging infrastructure at the right locations. In this chapter we set out our approach to forecasting the requirements for charging determining where chargers are located.

Developing a growth model

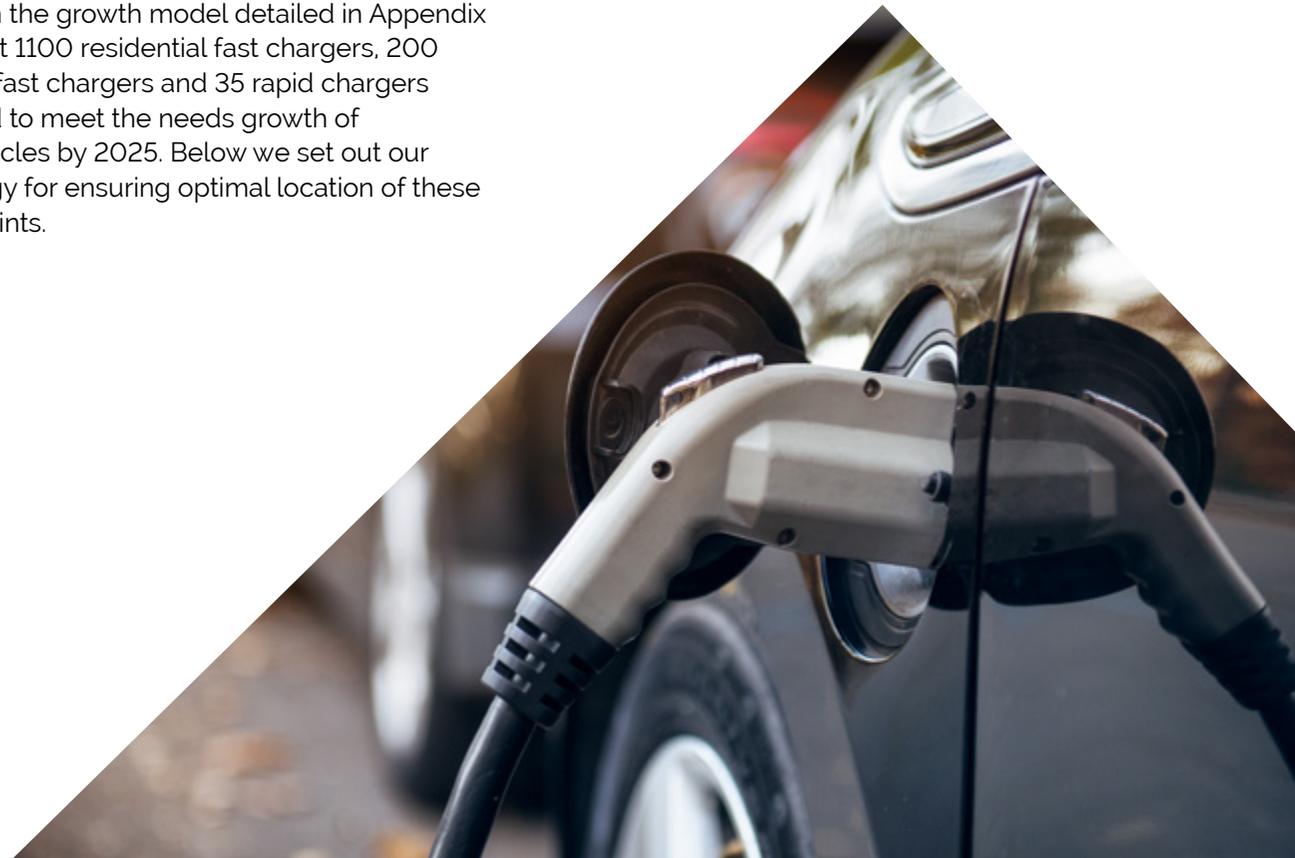
In 2017 the Mayor of London's EV Task Force developed a forecast model which aimed to provide an insight into how many chargers of each type may be needed in London up to 2025. This was a key part of the evidence base used to understand London's EV needs since the delivery plan was published. The model has been based on an understanding of electric vehicle growth, likely user behaviour and how chargers are used. It was research based and had been reviewed by a range of experts, including several members of the taskforce.

This delivery plan builds on the assumptions of the taskforce model while making adjustments to reflect local characteristics by applying Tower Hamlets figures. Further adjustments have been made to reflect recent technological and regulatory advancements which have occurred since 2017.

Key developments include implementation of the Ultra-Low Emission Zone (ULEZ) and Government announcement on the ban in the sale of new petrol and diesel vehicles from 2030. These are certain to accelerate the speed at which EVs are adopted in the borough and therefore the infrastructure required to charge them.

Required number of charging points

Output from the growth model detailed in Appendix A shows that 1100 residential fast chargers, 200 destination fast chargers and 35 rapid chargers are required to meet the needs growth of electric vehicles by 2025. Below we set out our methodology for ensuring optimal location of these charging points.



Where we will locate charging points

This delivery plan is focused on ensuring that all of our residents and businesses have suitable access to a charging point. Data shows less than 12% of residents do not live within 3-minute walk from any kind of public charger.

We will focus on addressing this by planning a network that minimises the distance needed to travel to a charging point. We aim to maximise the number of households and businesses residents and businesses are within 400m or three minutes' walk from a public charging point. Furthermore, we will ensure that we install the right types of chargers in the right locations.

Street types

In 2012, TfL set up the Roads Task Force (RTF) which developed a system of classifying London's roads into 'Street Types' by considering their movement and place functions. These street types would then be used to consider the functions and performance of the road network in a holistic manner when considering the types of improvements that are made to the streets. These street types will be used to inform the right places for the three types of charger.

Roads Task Force Street Types

Strategic significance	Arterial road	High road	City hub /boulevard
Management	Connector	High street	City street
Local significance	Local street	Town square /street	City place
	Local significance	Place	Strategic significance

Where we will locate charging points

Residential slow and fast charging (7kw)

Using the roads task force classifications, local streets which have a low movement function and low place function will be where our residential charging points will be installed. These charge points will be either 5kw lamp columns chargers or 7kw standalone fast chargers. These will charge a standard electric vehicle in 7-10 hours.



Destination fast charging (22kw)

Destination charging points will be installed on high streets, city streets, town squares/streets and city places under the RTF designations. Key customers for destination charge points are visitors/shoppers and freight and fleet operators parking for a few hours. Places in Tower Hamlets that provide access to a range of commercial, cultural and civic activities, including shopping, leisure, employment, entertainment, culture, and social and community facilities. These will charge a standard electric vehicle in 4-6 hours.



Rapid charging (50kw)

Rapid charge points will be installed on arterial roads, high roads, city hubs/boulevards, and connectors. Rapid chargers provide charging for high mileage users such as zero emission 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. These will charge a standard electric vehicle in 30 minutes to an hour.



A new residential charging network

We will install a network of 1100 residential charging points across the borough ensuring most residents are no longer than 3 minutes' walk from a residential charging point. These residential charging points will be delivered through a mix of 5kw lamp column points, 7kw fast, and 50kw rapid charging points.

If an electric vehicle is going to be left charging frequently for a prolonged period, then the driver will likely want that charging site within a convenient walk of their home. We will therefore seek to ensure that the network is planned to minimize the distance travelled to the nearest charging point. Our methodology for doing this is detailed in Appendix B.



A new destination charging network

Destination charge points will be in places where people stay for a few hours such as gyms, supermarkets and shopping centres. This will enable EV owners to incorporate charging into their usual routine. The model has set out that 200 destination chargers will be required by 2025. These will be located in key destinations including high streets, city streets, town squares/streets and city places. Destination charging points will charge up to 22kwh and will be deployed as double chargers at each of the destinations listed below.

Destination charging points

Located in key destinations and delivered through the Source London network. Locations include:

- Roman Road
- Roman Road West/Globe Market
- Whitechapel Market
- London Hospital
- Watney Market
- Bethnal Green Road
- Chrisp Street
- York Hall
- Tiller Leisure Centre
- Wapping
- Whitechapel Sport Centre
- Mile End
- St Georges Baths
- Poplar Baths
- Waitrose
- Sainsburys Whitechapel
- Crossharbour
- Victoria Park
- Kind Edward Memorial Park
- Bartlett Park
- Shoreditch High Street
- Brick Lane

A new rapid charging network

We will install 35 rapid charging points over two years to support zero emission capable taxis and support high mileage daily use vehicles that drive in and through the borough. Rapid charging points will be installed on arterial roads, high roads, city hubs/ boulevards, and connectors. Rapid chargers provide charging for high mileage users such as zero emission 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.

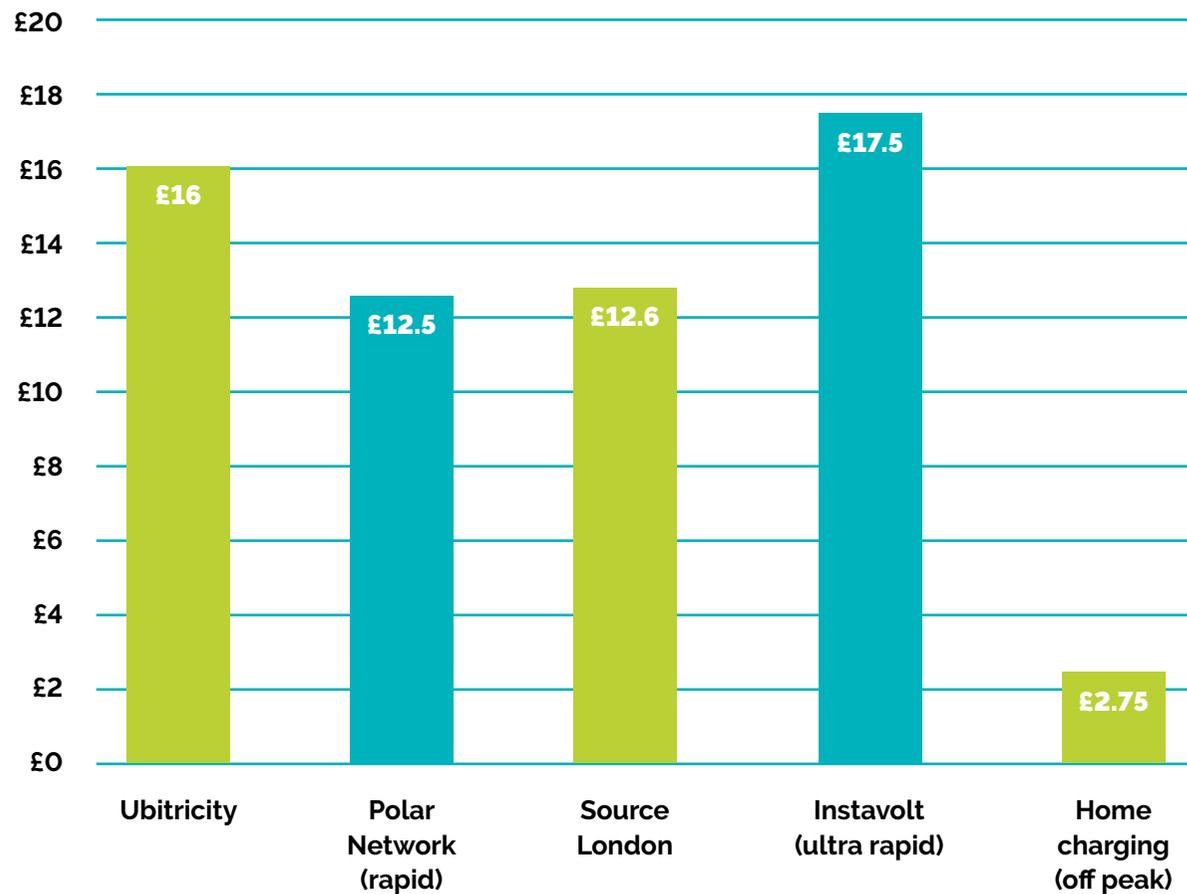


Reducing the cost of charging points

The cost of charging a standard electric vehicle from a home charger can be much lower than using a public charger. Figure 5 shows the difference in costs for a 40kw charge between the main charging operators and home charging.

This disparity in charging costs is particularly significant for Tower Hamlets which has the highest proportion of homes with no access to private parking in London at 93%. The reduction in running costs is a key driver to encouraging the switch to electric vehicles and for Tower Hamlets reducing the costs of charging will be crucial to maximizing EV adoption in the borough.

Figure 5: Comparison of public charging and home charging costs



Reducing the cost of charging points

Exploring different operating models

To have greater control on the costs of charging in Tower Hamlets, the council has assessed the feasibility of owning and operating its own charging network. This approach contrasts with how electric vehicle charging is usually deployed in most London boroughs where council's offer a full concession to an entity (usually a private company) to build and operate a network for a fixed period.

By owning and operating our own network, the council would have more control on the cost of charging, and it would enable us to be more effective at reducing the disparity between home charging and public charging.

Concessionaire model

With this model, the council offers a full concession to an entity (usually a private company) to build and operate a network for a fixed period. Advantages of this approach include:

- Charging points and installation is funded by the concession operator.
- Charging points are maintained and operated by the concession operator.

Borough owned network

This model involves the charging network being owned and operated by the council. This would be through establishing contracts for the operation and maintenance and the day to day running of the network with one or more operators.

Advantages of this approach include:

- Allows the council to have greater control on the customer experience.
- Gives the council greater say in charging costs.
- Gives the council greater say in where charging points are located.
- The council can collect revenue and re-invest into further expansion of the network.

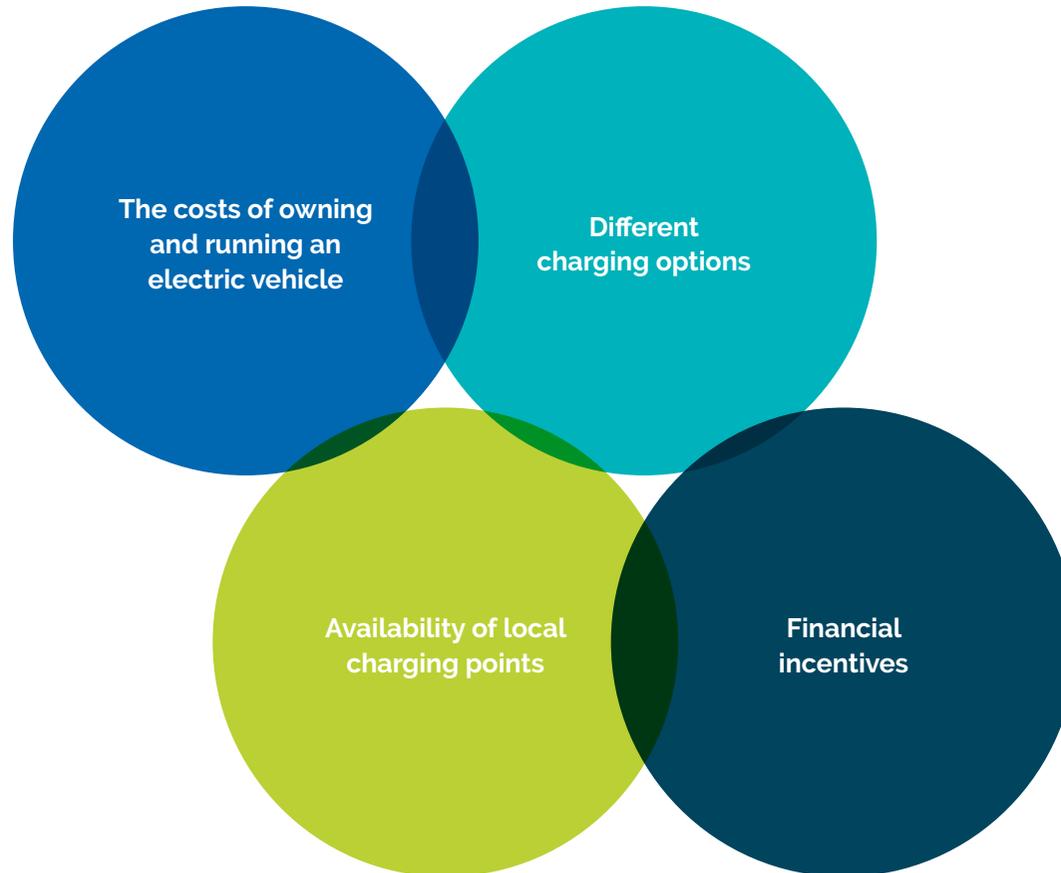


2. Improving information on electric vehicles

Despite the recent growth of electric vehicles, they are still a relatively new concept to many of our residents and businesses. Many of the electric vehicles that currently exist in the borough can be attributed to early adopters. However, the majority are unaware or just learning about the advantages of electric vehicles and misconceptions are still common.

The provision of clear and concise information is crucial to aid the transition towards electric vehicle adoption. Potential user awareness of the benefits, potential savings, charge point availability, and financial incentives supports the provision of charging points and lower charging costs in encouraging the uptake of EVs. We will therefore develop a new EV portal which provides information in order to demystify electric vehicles in an accessible way.

This will include information on:



2. Improving information on electric vehicles

Delivery timeline

LBTH charge point delivery phasing				
Charger type	2022	2023	2024	2025
Residential slow chargers (5kw)	300	350	500	900
Residential fast chargers (7kw)	20	100	150	200
Destination fast charging (7kw-22kw)	20	50	150	215
Rapid charging (50kw)	0	10	25	35
Total	340	510	825	1400

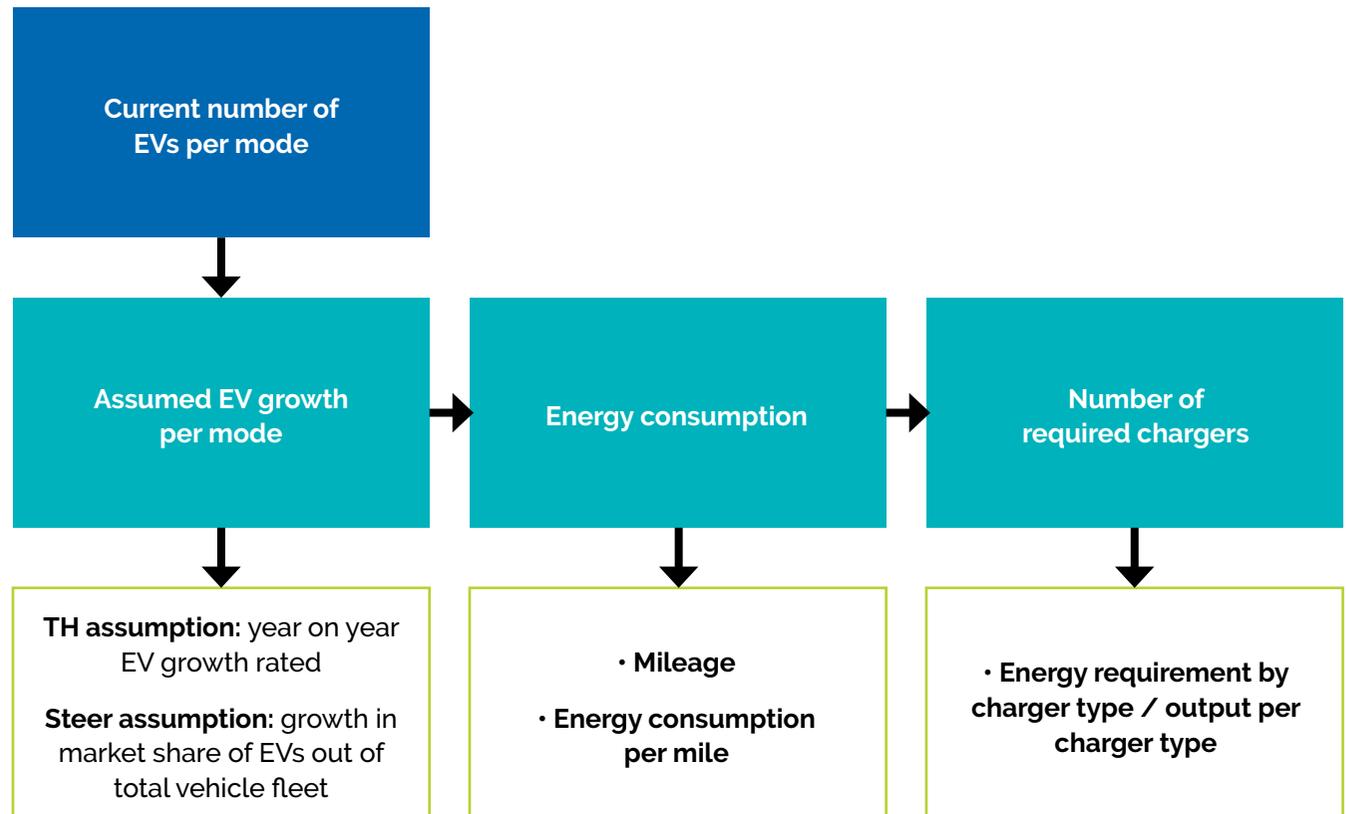
Appendix A

Electric Vehicle Growth Modelling

In 2017 the Mayors of London's Electric Vehicle Task Force developed a quantitative model which aimed to provide new insight into how many chargers of which type may be needed in London up to 2025. This has been a key part of the evidence base used to understand London's EV needs since the delivery plan was published in 2017. The model has been based on the best current understanding of EV trajectories, vehicle/charging technology, range of likely user behaviour and charger utilisation. It is research based, has been stress tested and has been reviewed by a range of experts, including several members of the taskforce.

This strategy builds on the assumptions of the taskforce model and applied to Tower Hamlets figures while making adjustments to reflect local characteristics by applying Tower Hamlets figures. Further adjustments have been made to reflect recent technological and regulatory advancements which have occurred since 2017. Figure 1.0 opposite presents the high-level guide to the modelling methodology that has been used to inform this delivery plan.

Figure 1.0: modelling methodology



Assumptions

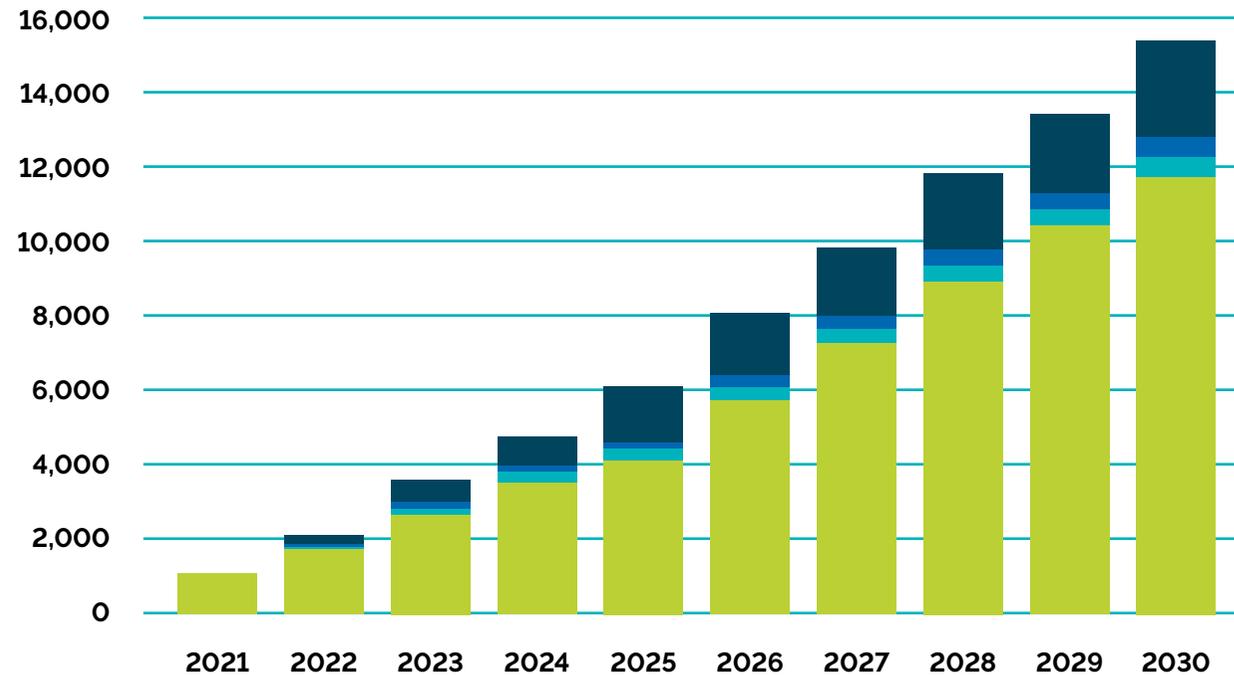
Growth of all vehicles

ONS data shows total licenced vehicles in Tower Hamlets has remained stable in the past 3 years at around 53,000. However, we have used an electric vehicle growth assumption that reflects the objectives of the borough to reduce private car ownership to 36,000 by 2041 (13% reduction from present day). This is an aspiration set out in the London Borough of Tower Hamlets Third Local Implementation Plan. The modelling scenario incorporates a gradual reduction in private car ownership, with the target being met in 2041.

Growth of electric vehicle sales

Looking into the growth profile of EVs, Figure 1.1 shows the forecast growth of EVs by each mode. The transition is expected to be steady over the next 10 years, with an increasing share of the fleet being electric year on year. From a position of 1,473 by the end of 2021, which quadruples to just over 6,000 in 2025 (12% of total vehicle fleet) and continues to climb reaching nearly 15,200 in 2030 (32% of total vehicle fleet).

E-Vehicles on road



Assumptions

Vehicle mileage

Milage Assumptions for each vehicle types are taken from the EV Taskforce Model (Table 1).

Table 1: mileage (miles per year)	
Car	7,500
Light goods	15,000
Motor cycles	500
Private hire	45,000

Energy requirements by vehicle type

Energy demand by kw/km is taken form analysis carried out by TfL (Table 2).

Table 2: electricity consumption (kWh/vehicle/mile)	
Car	0.18
Light goods	0.25
Motor cycles	0.06
Private hire	0.2

Energy output (utilisation) by charger type

An assumption regarding average energy provided per charger is required to attempt linking energy demand to the scale of infrastructure chargers. Table 3 shows what can be considered a reasonable range of average utilisation by plug-in time. While maximum theoretical utilisation may be 24 hours per day, this is considered impractical and would be likely to involve unreasonable levels of queuing

Table 3: effective utilisation (hours/day)	
Residential (on-street)	5
Destination	5
Rapid charging	3

Appendix B

Catchment modelling tool

We have used a catchment modelling tool to optimise the locations of charging points to maximise the coverage of charging points by reducing walking distance. There are over 300 locations identified for EV charging which cover 73% of households in the borough within 3 minutes' walk and 100% of households within 5 minutes' walk.

