

Redbridge Electric Vehicle Strategy (2024 — 2033)

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Glossary

BEVs Battery Electric Vehicles (BEVs) are pure electric and only use chemical energy in rechargeable battery packs, with no secondary source of propulsion.

CAZs Clean Air Zones (CAZs) are dedicated areas within the UK where there is targeted action to improve air quality.

CPOs Charge Point Operators (CPOs) are private entities that supply, install and operate EV chargepoints

DfT Department for Transport

EVs Electric Vehicles (EVs) powered by an electric motor for propulsion.

EVCP Electric Vehicle Charge Points (EV chargepoints), also referred to as EV chargepoints, are the infrastructure for charging EVs. Duration to fully charge vehicles varies depending on the capacity of the EV chargepoints.

ICCT The International Council on Clean Transportation (ICCT) is an independent non-profit organisation. The ICCT provides technical and scientific analysis on the environment to regulators.

LEVI Local Electric Vehicle Infrastructure

OZEV Office for Zero Emission Vehicles

PHEVs Plug-in Hybrid Electric Vehicles (PHEV) can utilise external energy sources to store power within the vehicle battery packs.

TfL Transport for London

ULEZ Ultra Low Emission Zone (ULEZ) is defined as a zone in which if a vehicle does not meet certain emission standards, then it is charged a fee of £12.50 per day.

VED Vehicle Excise Duty (VED) is an annual tax that is imposed as an excise duty for powered vehicles which are used on public roads.



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Executive Summary

Our Vision

Redbridge Council will facilitate the provision of accessible, reliable, and inclusive Electric Vehicle (EV) EV chargepoints, which is fairly priced, to all residents, visitors and businesses.

The Redbridge Electric Vehicle Strategy (2024 — 2033) (the Strategy) is developed to support a smooth transition to Zero Emission Vehicles (ZEVs) across the borough, while considering our core objectives of encouraging and enabling walking, wheeling and cycling. The Strategy supports our vision to become carbon neutral by 2030 and carbon zero by 2050.

Objectives

Our core objectives for the borough include:



Increase awareness and knowledge of EVs in the borough



Develop a network of public EV chargepoints ensuring appropriate coverage of the right types of EV chargepoints across the borough (e.g. slow, fast, rapid, ultra-rapid)



Develop an EV charging infrastructure network which is sustainable economically, technically and fair priced for users



Lead by example and electrify our own fleet of vehicles and ensure our staff travel choices are environmentally friendly



Ensure our EV charging infrastructure network is inclusive, reliable and accessible



Facilitate a transition to EVs for both private and commercial users while encouraging walking and cycling and reducing car ownership and car mode share

Principles for EV chargepoints



User focused



Safe and secure



Robust, long lasting, and scalable



Accessible



Inclusive



Current scenario

There are currently about 2,600 EVs in Redbridge which is less than 3% of total registered vehicles. However, **we anticipate this to increase to about 150,000 electric vehicles by 2035. To support this rapid growth in EVs, there is a need to increase the number of public EV chargepoints across the borough.**

As of March 2024, the borough is serviced by about 100 public EV chargepoints including 50 slow (lamp column), 45 fast (mostly operated by Char.gy and also Electric Blue), four rapid and two ultra-rapid EV chargepoints operated by BP Pulse and ESB Energy. These are EV chargepoints procured by the council. At the same time there are several other publicly accessible EV chargepoints across the borough offered on private land such as at supermarkets and petrol filling stations.

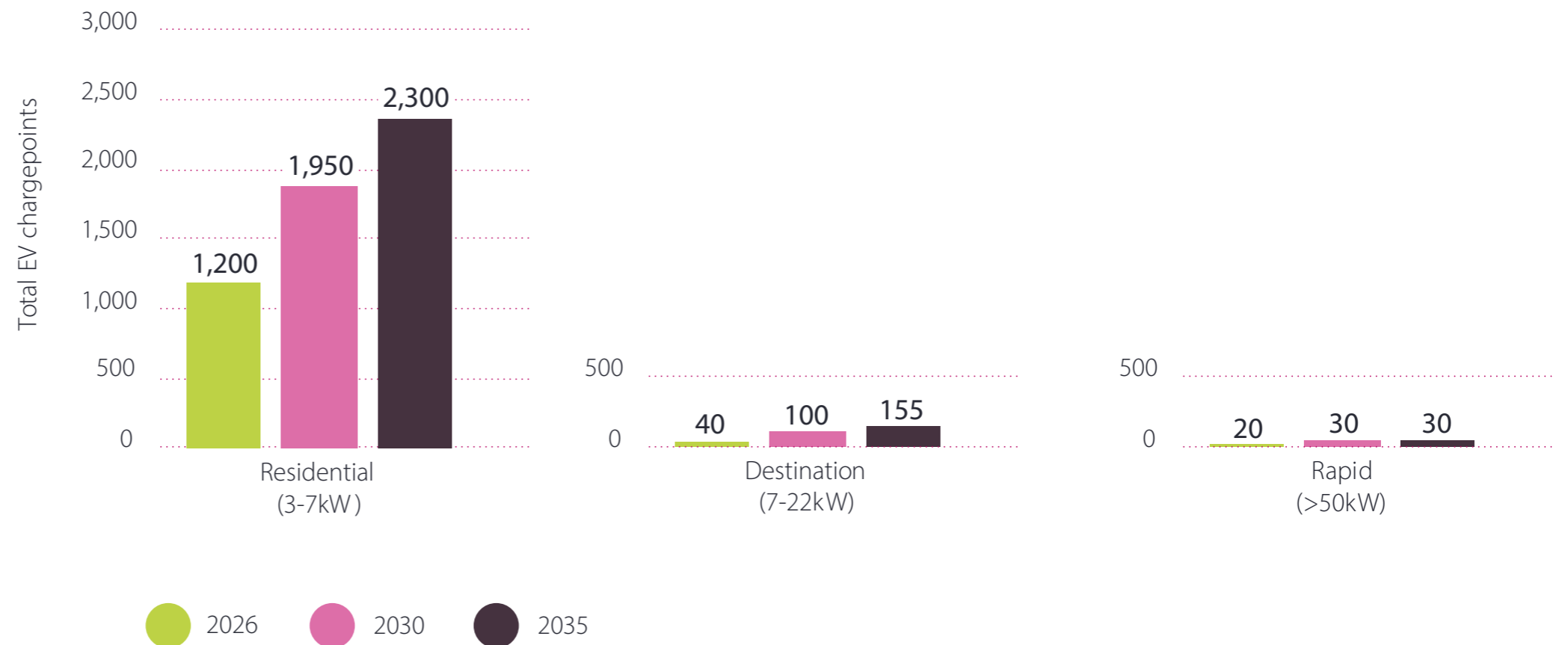
Additional 450 slow/fast EV chargepoints have been procured by the council with installation planned in 2024. When these planned EV chargepoints are delivered, **two-thirds of Redbridge population will have access to an EV chargepoint within a 5-minute walk from their homes/place of residence.**

Key ambitions for EV chargepoints

The borough has aspirations to grow the number of public EV chargepoints based on expected demand. The minimum number of EV chargepoints that will be available on public land are presented in Figure 1.1.

Figure 1.1. Forecast public EV chargepoints for Redbridge

Source: 'Fulfilling electric vehicle charging infrastructure needs in Greater London and its boroughs' by International Council on Clean Transportation (ICCT) (Minimum numbers forecast for Redbridge in Table A.2 Primary rapid charging emphasis and Table A.2 High sales residential charging)



Actions

In preparation for the expected growth in EV adoption, the borough plans to implement a proactive approach to deliver EV chargepoints based on user needs as and when they arise.

To achieve the vision and core objectives of the borough, we have prepared an action plan for short (2026), medium (2029) and long (2032) term (see Chapter 7). Our key actions include:

By 2026:

- Ensure every resident is within at least a 5-minute walk of an EV chargepoint.
- Continue with the progress of installing additional EV chargepoint for residential use, including planned procurement of up to 1,000 EV chargepoints using the Local Electric Vehicle Infrastructure (LEVI) funding.
- Continue to work with EV chargepoint operators such as BP to identify potential sites and deliver EV chargepoints on highway/non-council land.
- Develop a prioritised roll-out plan for the procurement of EV chargepoints across Redbridge's car parks, e.g. at leisure facilities and parks and at our housing estates, based on the underlying demand in the area.

By 2030:

- Ensure every resident is within at least a 3-minute walk of an EV chargepoint.
- At least 75 rapid EV chargepoints to be made available across the borough.
- Ensure all council's light vehicles are Net Zero, subject to funding availability. All new contracts with third party service providers will require them to have a Climate Emergency Plan and deliver a Net Zero contract.
- Ensure 20% of council-owned parking spaces have EV chargepoint facility.

Ongoing:

- Ensure that several EV chargepoint network providers operate in the area to allow competition and fairly-priced tariffs and dynamic pricing or smart charging options.
- Ensure all new EV chargepoints meet the accessibility standards set out for accessible charging in British Standard Institution (BSI) guidance.
- Ensure parking for EV EV chargepoints do not replace parking designated for disabled people.
- Ensure EV EV chargepoints in car parks are clearly marked and signposted. On-street EV chargepoints will be clearly signposted and a case-by-case basis consideration will be made to add dedicated on-street EV chargepoints (particularly in areas where there is limited off-street parking).
- Develop more Mobility Hubs such as the ones in South Woodford and Wanstead.



1. Introduction

Context

This Strategy sets out the vision, objectives and action plan to support a transition to EVs in Redbridge by delivering EV chargepoints for residents, businesses and visitors, while also addressing the local barriers to EV adoption.

The development of this Strategy has been led by the Highways, Parking and Transportation department, Redbridge Council, and has been informed by engagement with different stakeholders such as Trojan Energy, Uber, Energy Savings Trust, Transport for London (TfL), Cenex, and Offices for Zero Emission Vehicles (OZEV). Elected Members provided guidance to the borough officers during the development of this Strategy.

A public consultation with Redbridge residents and other stakeholder groups on a Draft Strategy was undertaken between 4 September 2023 and 26 November 2023 and feedback from the consultation has been incorporated into this final version of the Strategy.

National targets

The UK Climate Change Act 2008 committed the UK to an 80% mandatory cut in carbon emissions by 2050 (compared to 1990 levels). This target was revised in 2019, now requiring the UK to become Net Zero by 2050 (100% reduction compared to 1990 levels). Based on the recommendations of the UK Sixth Carbon Budget (2033-2037), the Government made a commitment in April 2021¹ to reduce the UK emissions of 78% by 2035.²

Transport is the UK's largest emitting domestic sector with 91% of the UK transport emissions associated with road transport. If the UK economy is set to achieve Net Zero by 2050, there is a need to decarbonise road transport. The DfT study *Taking charge: the electric vehicle infrastructure strategy*³ has set a target for the UK to have 300,000 to 750,000 EV chargepoints by 2030.

To push further on the road transport decarbonisation agenda, the UK Prime Minister announced a ban on sales of all new petrol and diesel cars and vans from 2035.³

EVs will play an important role in supporting transport decarbonisation. Provision of an accessible network of public EV chargepoints is essential in supporting EV uptake, given the fact that 30% of the UK population does not have access to off-street parking and, therefore, an at-home chargepoint.⁴ The DfT study also encourages local authorities to develop and implement local targets and EV chargepoint strategies that support the provision of affordable and convenient public chargepoint for residents, visitors, and businesses.⁴

Redbridge outlook

Redbridge aims to decarbonise its transport network by 2030 which is in line with the London Mayor's target.⁵ **The Redbridge Corporate Plan has already committed to deliver 1,000 EV chargepoints by 2026.**

Redbridge has a population of 310,300 residents, where 72% of residents have access to a car, which is roughly 15% higher than London average of 56%.⁶ EV ownership in Redbridge lags slightly behind other boroughs with about 2,600 registered plug-in vehicles including cars, vans and motorcycles (as of Q1 2022),⁷ which is less than 3% of total registered vehicles. The borough has constructed two mobility hubs and a community hub with electric car club vehicles, fast chargepoint, and other amenities. Redbridge is the first borough to feature wireless chargepoint stations as part of the Innovate UK project.

While the Redbridge Local Transport Plan aims for walking, cycling and public transport to account for 80% of all trips by 2041,⁸ there will still be a proportion of trips that will be made by car including both personal and business trips. Redbridge's aim is to transition these remaining car trips to be low- or zero-emission.

The borough currently has 50 slow/lamp column (3-7kW), 45 fast (7-22kW), four rapid (50kW) and two ultra-rapid (150kW) public EV chargepoints operated by Char.gy, Electric Blue, BP Pulse and ESB energy, with a further 310 slow and 140 fast EV chargepoints being installed in 2024 (See Table 1.2 and Figure 1.2).

Table 1.1. EV uptake and EV chargepoint access across Redbridge and the neighboring boroughs

Source: DfT Table VEH105 and VEH0142, data as of Q3 2023, and Field Dynamics Charger coverage data as of 2022.

	Redbridge	Havering	Barking and Dagenham	Waltham Forest	Newham
Number of EVs (cars and light goods vehicles)	2,258	1,964	1,215	1,082	1,156
% of EVs in total registered cars and vans	2.1%	1.6%	1.7%	1.3%	1.6%
% of households without off-street parking within 5-min walk to an EV chargepoint	31.8%	9%	16.5%	84.7%	54.6%



Table 1.2. Existing and planned EV chargepoints in Redbridge by type

Source: London Borough of Redbridge; Note: this table includes EV chargepoints on council/public land only. Any home-based, workplace or private destination EV chargepoints available across the borough are not included.



EV chargepoint type

Slow/lamp column
(3-7kW)

Existing distribution

50 concentrated in South Woodford and Wanstead.

In procurement

310 (expected to be installed in 2024).



Fast (7-22kW)

34 in several on-street locations,
8 Mulberry Way Car Park,
2 Wanstead Mobility Hub, and
1 South Woodford Mobility Hub.

140 (expected to be installed in 2024) with the majority being in residential areas between Ilford and Goodmayes stations.



Rapid (50kW)

1 South Woodford,
1 Gants Hill,
and 2 Goodmayes.

N/A



Ultra-rapid (>50kW)

2 in Ley Street

N/A



To date the EV chargepoint deployment in the borough has been driven by requests for EV chargepoint from the residents prior to the 2021 ULEZ expansion.

As EV uptake increases across the borough, particularly in areas with limited access to off-street parking, public EV chargepoint provision will have to increase to support the London Plan's objective of providing EV chargepoints at minimum 20% of parking spaces and

80% of spaces to have passive provision to allow for easy future installation of EV chargepoints.⁹ This has been managed by the Buildings Control department, instead of Planning since June 2023.

This Strategy and Action Plan presents a proactive approach to underpin the future requirements for EV infrastructure in the borough and measures to implement them.

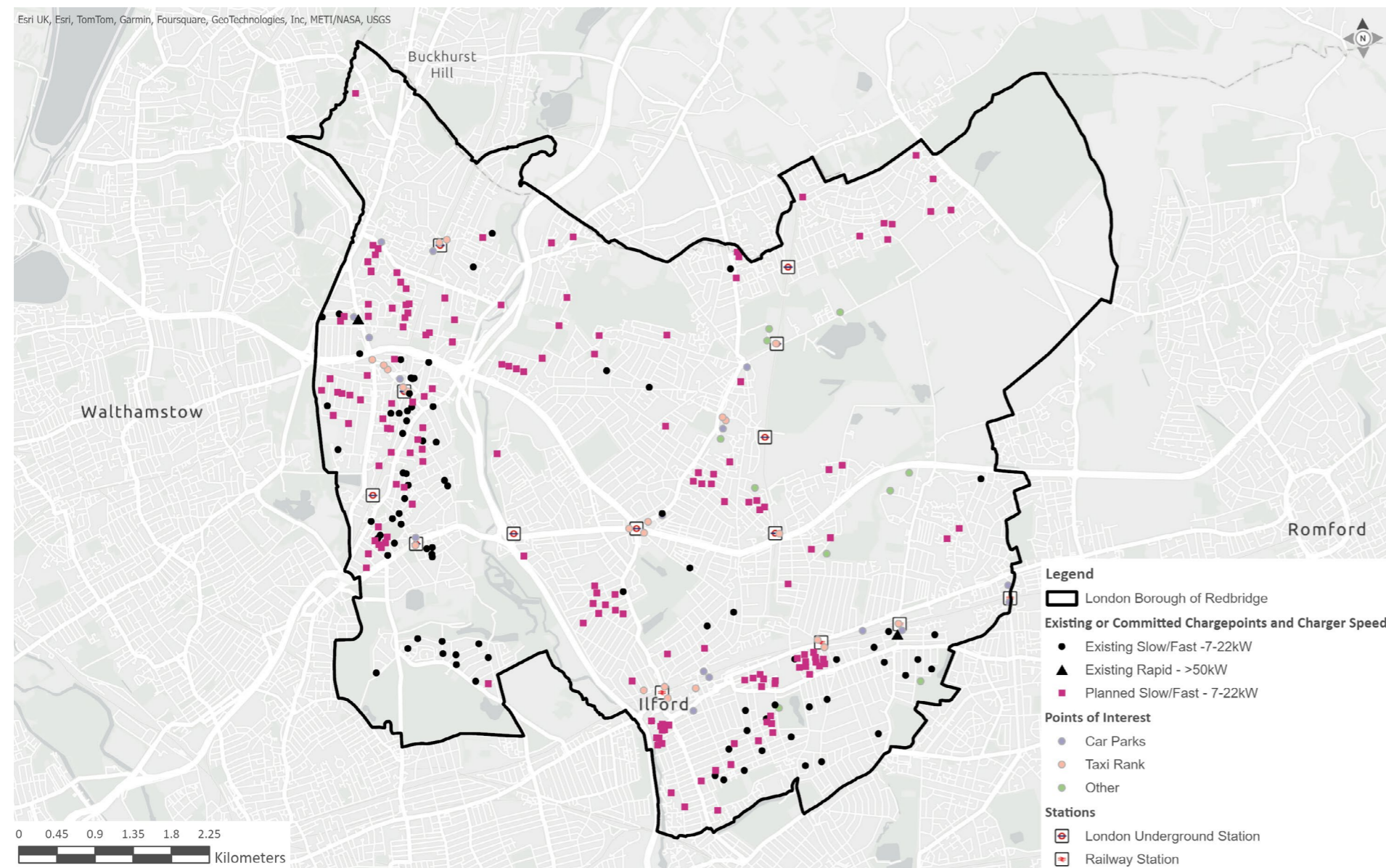
Structure of the document

This Strategy consists of the following chapters:

- Chapter 2: Drivers and Barriers
- Chapter 3: Vision, Objectives and Principles;
- Chapter 4: Overview of EV chargepoints;
- Chapter 5: Demand for EV Charging Infrastructure;
- Chapter 6: Forecast EV Infrastructure Requirements; and
- Chapter 7: Action Plan.

Figure 1.2. Redbridge existing and planned EV chargepoint locations

Source: London Borough of Redbridge



2. Drivers and Barriers

This Chapter provides a summary of the key drivers and barriers to EV adoption in the UK.

Figure 2.1. Key drivers and barriers for EV adoption. Source: Steer

Drivers



Cost savings: rising costs of petrol/diesel



Avoidance of congestion charging and clean air zones payment, as and when they are expanded



Motivation to reduce carbon emissions

Barriers



Purchase price



Lack of reliable EV charging infrastructure



Percieved range anxiety



Lack of awareness of EV capabilities



Concerns about negative impact of EVs on the environment



Drivers and barriers for EV adoption

Drivers

The key drivers for buying an EV in the UK include cost savings from cheaper running costs (associated with slower depreciation of EVs and rising costs of petrol and diesel in the UK). There is also no road tax for Battery Electric Vehicles (BEVs) or pure EVs until 2025, and they are exempt in the clean-air zones (CAZ) during the same period.¹⁰ Conversely, the owners of Plug-In Hybrid Electric Vehicles (PHEVs) or hybrid vehicles pay a reduced Vehicle Excise Duty (VED).¹¹

In London, EVs can be used for free within the congestion charge zone and the Ultra-Low Emission Zone (ULEZ) areas. The ULEZ area has been expanded to cover all the areas within the Greater London Authority boundary including the London Borough of Redbridge. This, alongside the new TfL administered scrappage grants,¹² will facilitate a shift to EVs.

The YouGov's study "The European electric car market" suggests that the desire to reduce carbon emissions is one of the motivating factors to purchase electric or hybrid vehicles. Over a half (51%) of respondents in Denmark, Finland, France, Germany, Italy, Norway, Spain, Sweden, and the UK stated that "helping the environment" is a good reason to buy an electric car.¹³

From 2035 it will not be possible to purchase new petrol and diesel cars and vans in the UK.

Barriers

The key barriers to buying an EV in the UK include purchase price, range concerns and concerns about availability of EV chargepoints. A 2020 survey of 1,000 people by Connected Kerb revealed cost (53%), access to chargepoint (45%) and range (38%) as barriers for EV purchase.¹⁴

The cost of EVs was mentioned the most as a reason for the drivers not switching to all-electric vehicles in the UK. The Opinions and Lifestyle Survey (OPN) stated that out of those respondents who are not likely to switch to EVs in next ten years, 70% mentioned cost of EV purchase being the main barrier, while 52% stated a lack of infrastructure being a deterring factor.¹⁵

An Ipsos MORI survey of UK drivers in October 2021 revealed that two thirds (63%) are not confident that sufficient number of EV chargepoints will be provided.¹⁶ 46% of respondents felt that they did not have enough information to make an informed decision about purchasing an EV.

Addressing the barriers

While the upfront costs of purchasing EVs are higher than their internal combustion engine (ICE) counterparts, the running costs and maintenance requirements are lower. However, EV purchase prices are expected to fall as production increases, and a price parity with ICE vehicles is expected anywhere between 2024 and 2030.¹⁷ With the efficiency and driving range of EVs increasing year on year, the running and maintenance costs of EVs will continue to fall. Additionally, as EVs enter the used cars market, the cost barrier is likely to decline.

Public chargepoint provision is highest in London,¹⁸ and, in addition to the known size of the public chargepoint network, there are private workplace EV chargepoints that residents may have access to. To support residents, visitors, and businesses in the borough, London Borough of Redbridge developed this Strategy, which sets out a clear vision alongside objectives to enable an accessible and inclusive transition to EVs and facilitate delivery of an appropriate mix of different EV chargepoints.



3. Vision, Objectives and Principles

The EV strategy is built around three main areas:

- **The Council's vision** for residents, businesses and visitors in the borough;
- The strategic **objectives** to realise the vision; and
- The five **principles** that will underpin EV chargepoint roll-out across the borough.

Policy imperative

A policy review was conducted to inform the vision and strategic objectives of the Strategy. The latest national, regional and local strategies and policies were reviewed.

The Strategy supports the UK Government's vision for 2030 that states that 'everyone should be able to access a reliable EV chargepoint through inclusively designed public charging and effortless on and off-street charging solutions.'

- The Strategy is imperative in helping deliver the Mayor's ambition for all council-generated emissions to be Net Zero by 2030.³³
- This Strategy is designed to support the Redbridge Climate Change Action Plan and commitments of the Redbridge Plan 2022-26 of achieving carbon neutrality, improving air quality and provision of EV infrastructure.
- **Redbridge will review updates to national and regional plans and strategies annually in order to identify new ways in which they can help the objectives identified in this plan.**



National, London and Redbridge policy commitments

National Commitments

Department for Transport (DfT) EV Infrastructure Strategy committed to:

- 80% of new cars and 70% of new vans sold set to be zero emission by 2030, increasing to 100% by 2035 (ZEV Mandate)

The Government's vision for 2030 includes:

- Widespread access to a reliable public chargepoint
- Effortless on and off-street EV charging
- Reliable network of high powered chargepoints along major roads
- Fairly-priced and inclusively designed public charging
- Market-led roll-out for the majority of EV chargepoints
- Infrastructure seamlessly integrated into a smart system
- Continued innovation to meet drivers' needs

London Commitments

The London Plan (the Mayor's Spatial Development Strategy) sets out the standards and development required for EV infrastructure:

- At least 20% of parking spaces should have active EV charging facilities
- Zero emission zones across London by 2050
- Zero emission zone in central London from 2025
- Introduce pricing incentives for EVs
- All new cars and vans zero emission by 2030
- From 2023 all taxis/private hire vehicles (PHV) need to be zero emission capable (ZEC)
- Net Zero by 2030

London's 2030 EV Infrastructure Strategy identified that:

- 40,000-60,000 EV chargepoints needed by 2030
- Public sector land could support 4,000 rapid EV chargepoints by 2030
- World's first ULEZ zone
- Need for five flagship rapid EV chargepoints in each sub-region by 2025

Redbridge Commitments

The Redbridge Corporate Plan 2022-26 outlines commitments across the borough:

- Improve air quality
- Improve incentives and infrastructure to support the switch to cleaner electric vehicles
- Open 1,000 EV chargepoints by 2026
- Invest £10m to resurface roads

Climate Change Action Plan aims to:

- Achieve carbon neutrality
- Achieve Mayor's target of 80% of all journeys made by active, efficient and sustainable modes by 2041
- Support zero emission car club vehicles through providing EV chargepoints (March 2022)
- Review demand for EV chargepoints using artificial intelligence (June 2022)
- Consult with residents and businesses on installing differential charging for parking permits (April 2023)
- Install at least 100 EV chargepoints a year subject to feasibility and consultation (2021-2024)

Third Local Implementation Plan outlines:

- 20% of parking spaces to have active EV charging facilities, end engine idling, and introduce air quality measures



Our vision

We will experience a smooth transition to EVs in Redbridge while encouraging and enabling walking, wheeling and cycling, reducing car ownership and usage in favour of active and public transport and supporting our target to become carbon neutral by 2030 and carbon zero by 2050.

All residents, visitors and businesses in Redbridge will have access to reliable and inclusive EV chargepoints, which is fairly priced.

The strategic objectives

A set of objectives have been identified which will underpin the achievement of our vision.



1. Increase awareness and knowledge of EVs in the borough.

- Support residents and businesses in increasing their awareness of the environmental issues we are facing and improve their knowledge of EVs and infrastructure.



2. Lead by example.

- Electrify our own fleet of vehicles and ensure our staff travel choices are environmentally friendly.
- Use EV technology to reduce the environmental impact of our day-to-day operations and demonstrate positive behaviour.
- Introduce Net Zero targets in our procurement services and require contractors to comply.



3. Develop a network of public EV chargepoints ensuring appropriate coverage of the right types of EV chargepoints across the borough.

- Support the residents without access to an EV chargepoint at home.
- Provide different types of EV chargepoints which suit the diverse needs of the borough reflecting various housing type, demographics and transportation characteristics.
- Support businesses, Taxi and Private Hire Vehicle (PHV) drivers, visitors and residents with options to charge or top-up their EVs quickly through rapid EV chargepoints roll-out.



4. Ensure our EV chargepoint network is inclusive, reliable, and accessible.

- Ensure a good minimum level of EV chargepoint provision and social equity to all residents, visitors and businesses.



5. Develop an EV chargepoint network which is sustainable economically, technically and fair priced for users.

- Future-proof the roll-out of EV chargepoints in the borough
- Support electrification of car clubs in the borough.



6. Facilitate a transition to EVs for both private and commercial users while encouraging walking and cycling and reducing car ownership and car mode share.

- Enable more people to experience and use EVs without owning them.



Principles for EV chargepoint roll-out

We have identified a set of essential principles that must underpin EV chargepoint roll-out in the borough:



User focused: EV chargepoints should be varied, offering flexibility for different user needs, easy to find, easy to use and reliable.



Inclusive: EV chargepoints should include facilities suitable for those with disabilities and children with adequate sizing, dropped kerbs and tactile paving.



Safe and secure: EV chargepoints should be safe by design without causing any obstruction or impediment to active travel zones.



Robust, long lasting, and scalable: EV chargepoints should be reliable with reduced lifetime cost.



Accessible: EV chargepoints should be easy to find and access and placed in areas, where there is a need to charge, without disrupting access to footpaths for other users.



4. EV chargepoints

This Chapter provides a summary of the different types of public EV charging infrastructure available in the market and emerging technologies.

Types of EV charging infrastructure

EV users have a range of options as to where, how, and when to charge their vehicles.

There are several types of public EV charging infrastructure which can be split into four main categories based on its power output: slow, fast, rapid and ultra-rapid.

Table 4.1 provides an overview of the power rating, location types and approximate charging times associated with each chargepoint type.

The charging time is a function of battery state of charge, battery capacity and on-board charging capabilities: for example, even if plugged into a 150 kW ultra-rapid chargepoint the majority of EV models available on the market will not be able to receive more than 100 kW.

Those with access to off-street parking (an estimated 67% of Redbridge households according to the On Street Charging platform)¹⁹ are likely to carry out the majority of their charging at home as this is the most convenient and cost-efficient method of charging. Rapid and ultra-rapid EV chargepoints are the most expensive form of charging per kWh but they offer the fastest service in terms of time of charging.





Private home EV chargepoints can be shared through schemes like co-chargepoint²⁰ and JustPark²¹ which enable individuals to act as chargepoint hosts.

Lamp column EV chargepoints are a tried and tested form of residential on-street charging for those without access to private EV chargepoints. They are convenient and relatively inexpensive particularly when used overnight on an off-peak tariff.

Redbridge currently operates a mixed provision of slow, fast, rapid and ultra-rapid EV chargepoints both on-street and in carparks. We have about 100 EV chargepoints in operation, of which 50 are slow lamp column EV chargepoints for overnight charging, 45 fast for destination charging, four rapid and two newly deployed ultra-rapid EV chargepoints for top-up charging. Our intention is to continue with a mixed provision of EV chargepoints through different EV chargepoint operators to encourage competition and provide our residents with a range of choices while remaining competitive.



Table 4.1. Types of EV chargepoints by charging speed, power, usage location type, and charging time from 0-100% charge except rapid and ultra-rapid which is *0 – 80% charge. Source: ZapMap

	EV chargepoint speed (and type)	EV chargepoint power	Connector type	Usage location type	Charging time	
					40 kWh battery (Nissan Leaf/ Renault Zoe)	90 kWh battery (Jaguar I-PACE)
	Slow (e.g. Wall, Lamp column)	3.6 kW	Type 1 or 2	Home; On-street.	14 hours	30 hours
	Fast (e.g. Lamp column, Bollard, Standalone, Flat and Flush)	7 kW	Type 1 or 2	Home; On-street; Destination.	6 hours	13 hours
		11-22 kW	Type 1 or 2	Home; Destination.	6 hours	13 hours
	Rapid (e.g. Standalone)	50 kW	CCS or CHAdeMO	On-street; Destination; En-route; Motorways.	40 minutes*	90 minutes*
	Ultra-rapid (e.g. Standalone)	100 kW	CCS or CHAdeMO	Destination; En-route; Motorways.	N/A	45 minutes*



Emerging technologies in EV charging infrastructure

The market engagement with EV chargepoint operators indicated that there are a range of upcoming technologies and innovations in EV charging solutions including gul-e, flat-and-flush EV chargepoints and wireless charging. The council will closely monitor development around these technologies and the outcomes of ongoing trials across the UK to help understand what can be delivered safely within the borough.

Figure 4.1. Connector types, left to right, CHAdeMO, CCS, Type 2, Type 1.
Source: www.zap-map.com

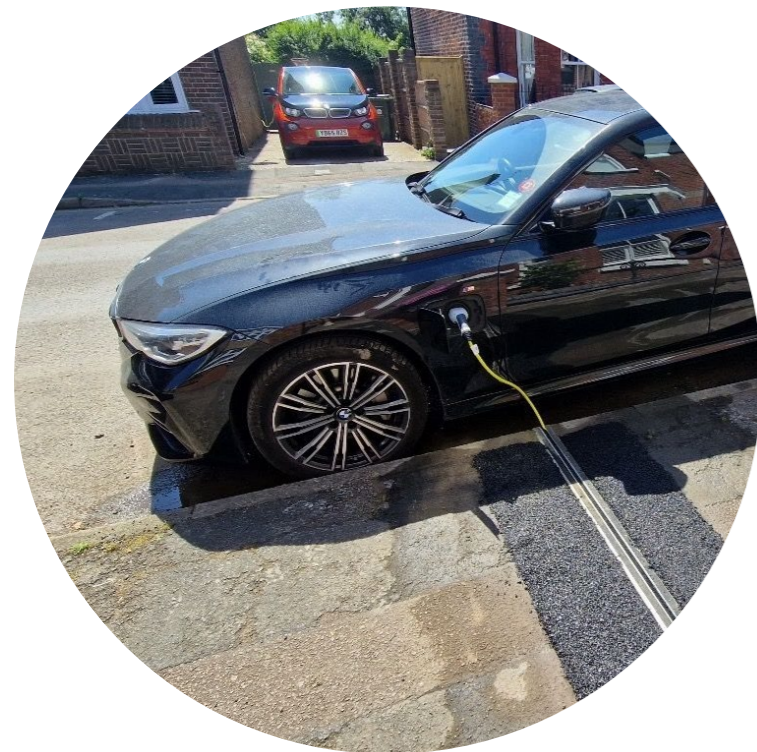
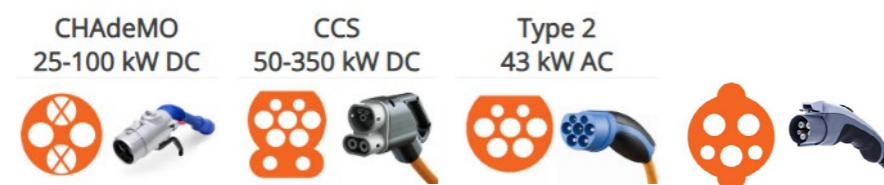


Figure 4.2. Gul-e
Source Transport Xtra

Gul-e

The Gul-e is a home EV charging solution which enables people without off-street parking to charge their cars at home through a dedicated cable designed to meet British Standards, without trailing wires across the pavement.²³ There are Gul-e pilots in Oxfordshire and there was a trial at 18 locations across Central Bedfordshire (until January 2023).

Some of the main advantages of Gul-e include:

- ✓ Can utilise residents' energy supply and, hence, means the tariff is cheaper;
- ✓ Cheaper installation costs compared to on-street EV Chargepoints; and
- ✓ No street clutter or trip hazards.

Some of the perceived disadvantages of Gul-e are:

- ✗ As this is a new form of infrastructure to be implemented on highways local planning policies and process will need to be updated;
- ✗ Requires space in front of the residents' house to be available when charging is required;
- ✗ Limited use for flats and other residential buildings in multiple occupancy;
- ✗ Difficult for council to clean and maintain the Gul-e on footways such as removal of snow / ice to use these could lead to damage/ slip claims; and
- ✗ Potentially complex to install depending on how the footways are paved.

Key learnings from current trials: Gul-e trial in Oxfordshire.³⁴³⁵

Background:

- The Gul-e provides a safe, secure and durable cable channel that is installed into the pavement (mitigating any trip hazard concerns), keeping the footpath 100% clear.
- The Oxfordshire Gul-e scheme was piloted by 30 volunteers at their homes.
- Funding for the Gul-e project was awarded by the Governments Office for Zero Emission Vehicles and Innovate UK.
- Although the Gul-e might not be suitable for all households, it is expected to form part of the overall package for EV charging infrastructure expansion (see Figure 4.2).

Feedback from users:

- Users have reported that the Gul-e was an easy-to-use home-charging solution, by simply parking in-front of their home, inserting the charging cable into the Gul-e and plugging the vehicle into their household energy supply.
- Users also highlighted that the Gul-e was convenient and cheaper compared to commercial charging rates.



Flat and Flush

Flat and Flush is a public EV charging solution developed with Innovate UK funding for those without access to off-street parking. These EV chargepoints does not require permanent raised street furniture at the pavement edge, which means they do not take up any space when not in use.²⁴ They pop up when a user plugs in a cable. Currently, there are Flat and Flush charging trials with Trojan Energy in Brent and Camden. Urban Electric Flat and Flush EV chargepoints is also being trialled in Oxford, Dundee, Plymouth and Staffordshire.

The main advantages of Flat and Flush chargepoints are:

- ✓ Disability Rights UK provided design input to improve usability for all drivers and increase safety for all street users;
- ✓ No street clutter when not in use; and
- ✓ Can be installed in areas without lampposts for on-street residential charging.

The key disadvantages relating to Flat and Flush chargepoints are:

- ✗ No commercial roll-out has been made to date, these could either be funded by the local authority or residents can pay for this themselves with council permission;
- ✗ Installation is more costly and disruptive than lamp column EV chargepoints because it requires highway excavation;
- ✗ Potential to cause a trip hazard; and
- ✗ May require higher ongoing maintenance and servicing costs compared to lamp column EV chargepoints.

Key learnings from current trials: Trojan Energy.²⁵

As part of the STEP trial, ten sets of 15 Flat and Flush chargepoints have been installed on six streets in Brent and four streets in Camden, see Figure 4.3. 150 EV drivers have signed up to take part in the trial which started in September 2022.²⁶

The technology provides on-street charging for residents without driveways or garages, whilst keeping streets safe and clear of obstacles.

The technology requires proprietary lance to access the Flat and Flush chargepoints which means only local residents signed up to the scheme and their visitors would have access to it.

Trojan Hub works alongside 'Deicer' Cameras which are linked to an app to alert users of availability.

Trojan Aon utilises residents' energy supply, hence it is cheaper to use Flat and Flush chargepoints during the trial compared to other on-street EV chargepoints.

Key learnings from previous trials: Urban Electric.²⁷

Urban Electric launched Flat and Flush trials in Oxford in 2018. Six on-street 7kW Flat and Flush chargepoints were installed in pavements, which could retract into the ground when not in use, see Figure 4.4.

The profile of the Flat and Flush chargepoint is designed to be visible by partially sighted people.

These Flat and Flush chargepoints are integrated with Appyway, which uses sensors and charging data to determine the availability of a chargepoint.



Figure 4.3 Trojan Energy chargepoint.

Source: Trojan Energy



Figure 4.4 Urban Electric chargepoint.

Source: Urban Electric



Wireless charging

Wireless charging is an innovative technology which is still being researched, tested and developed through a small number of pilots and trials globally. For example, Nottinghamshire is taking part in a wireless charging trial, which will analyse nine electric taxis fitted with wireless charging hardware to assess its commercial and technical viability.²²

The technology is not currently commercially or technically ready. One of the main barriers is the fact that current electric vehicles need to have expensive and bespoke retrofits to be able to charge from wireless EV chargepoints.

Redbridge was a partner in the Innovate UK funded On-Street Residential Induction Charging (OSRIC) Project. The project explored the potential for installing wireless EV chargepoints in residential areas. The project involved installing wireless chargepoints in four sites including Herbert Road; Cowley Road; Berkeley Avenue; and Derby Road car park and four retrofitted car club vehicles were used in each site.

The outputs were that the cars could be converted to wireless charging successfully, but that the charging levels were limited due to technology at the time, but it proved an excellent exercise to be able to feedback to the market for longer term development.

The main advantages of wireless charging include:

- ✓ Eliminates the need for cables which removes street clutter and potential trip hazards for other road or pavement users; and
- ✓ Eliminates the requirement to plug and unplug heavy cables which improves accessibility to EVs for disabled and frail drivers.

The disadvantages relating to wireless charging are as following:

- ✗ Low technology readiness level, still in a trial/testing stage;
- ✗ The cost per kW of wireless charging could be expensive; and
- ✗ Requires the vehicles to be retrofitted with wireless charging capabilities to utilise the technology which limits the types of vehicles that can make use of the chargepoint (e.g., wireless receiver pad added underneath a vehicle, which can be difficult with a low lying vehicle).



5. Demand for EV Charging Infrastructure

To date the chargepoint deployment in the borough has been led by requests from the residents and businesses to support them with access to EV charging infrastructure prior to the 2021 ULEZ expansion, as well as based on interests from EV chargepoint operators and funding availability. However, the borough is committed to taking a proactive approach to the delivery of a strategic network of EV chargepoints of different charging capacities to support a smooth transition to EVs by all residents and businesses.

This chapter presents an analysis of underlying demand and need for EV charging infrastructure in the borough.

Potential demand for EV charging infrastructure

To develop a proactive EV chargepoint deployment strategy, we have evaluated the underlying potential demand for EV charging infrastructure across the borough. We have undertaken a hexcell²⁸ based GIS data analysis to estimate the underlying demand for:

- **Slow/Fast charging** focussing on charging needs of residents without access to a driveway to charge their vehicles at home; and
- **Rapid charging** at points of interest, for top-up charging by residents, taxi and PHV drivers, businesses/employees and visitors.

The underlying demand maps for slow/fast and rapid charging are presented in Figure 5.1 and Figure 5.2 respectively. The areas highlighted in dark red colour have the highest potential demand followed by dark orange, orange and yellow.

Subsequent EV chargepoint locations will be selected based on the relative demand maps focussing on areas with the highest relative demand first followed by areas with lower demand. It should be noted that site visits and analysis of suitability of locations, including power availability (UKPN can help with this) in the indicated areas will be undertaken to determine precise locations and the viable chargepoint types. Engagement with local businesses or landowners will be carried out to understand if they are planning any EV chargepoint deployment in their properties for public use (e.g. supermarkets, etc.).



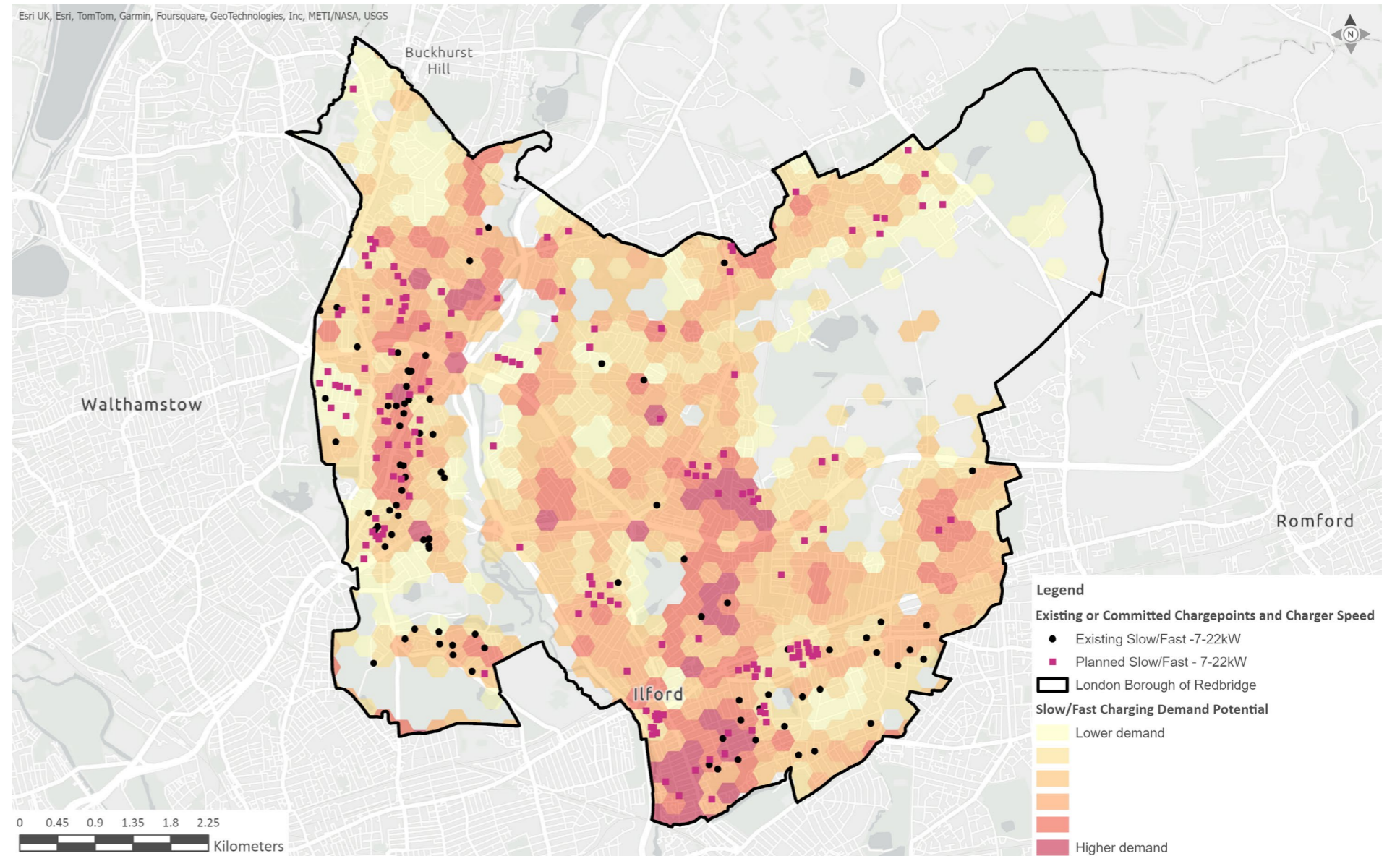
Slow/Fast charging

Slow/Fast charging demand could be met by a selection of EV chargepoint types from lamp column, bollard and free standing to innovative charging solutions such as flat-and-flush and gul-e and would typically mean charging capacity of 7 to 22kW.

There is a high unmet demand and potential for increasing the network of slow/fast EV chargepoints in the following three areas (see Figure 5.1):

- **South of the borough covering the area between North Circular Road (A406), Ilford High Road (A118) and Goodmayes Lane B177;**
- **Centre of the borough north of A12 along Horns Road to Barkingside station; and**
- **North-west of the borough west of M11/river Roding and north of A406 in Woodford.**

Figure 5.1. Demand for slow/fast charging overlaid with existing and planned EV chargepoint locations. Source: Steer

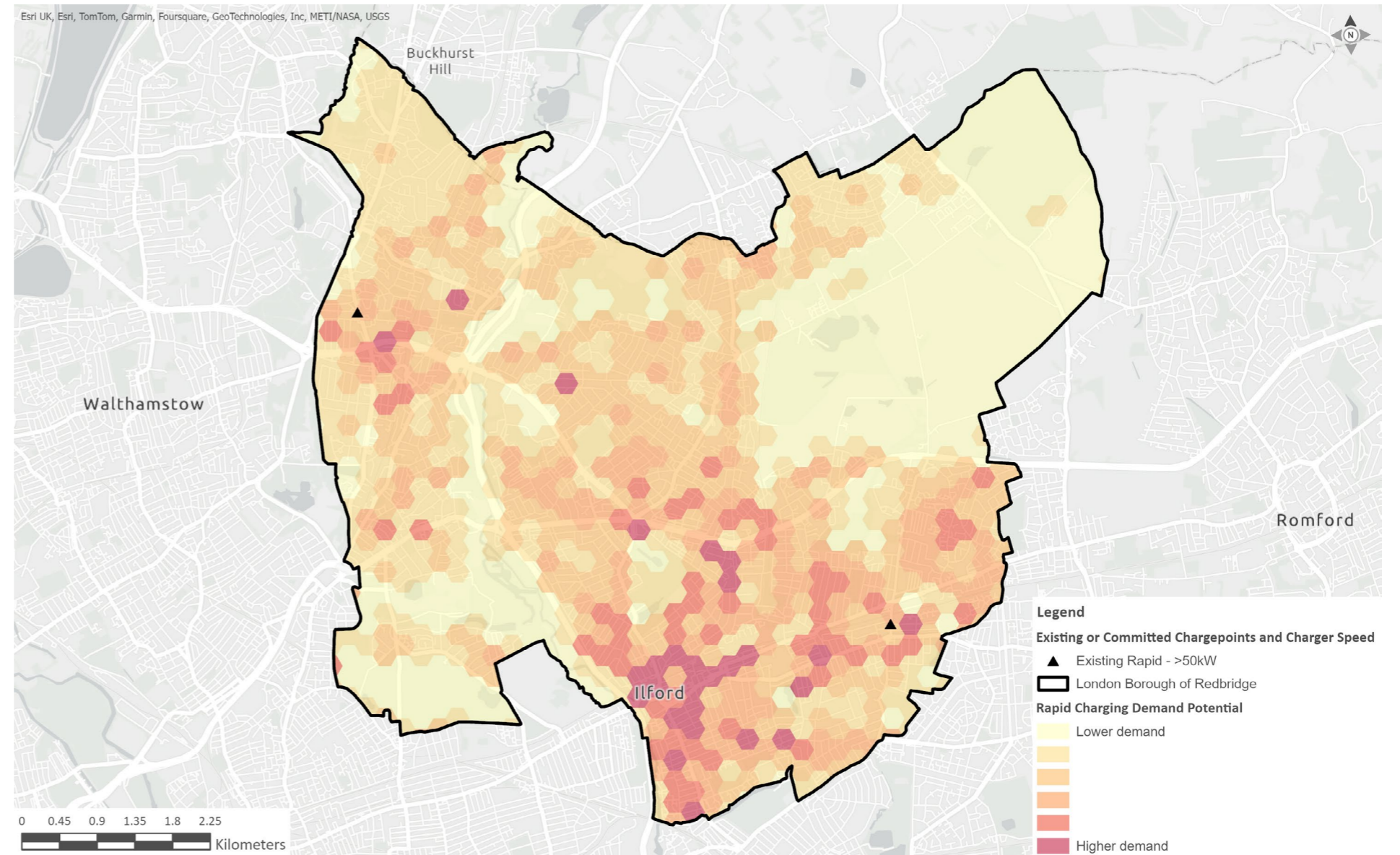


Rapid charging

Rapid charging demand is met typically by 50 kW+ EV chargepoints.

There are currently only three locations in Redbridge with rapid charging – Derby Road in South Woodford, Goodmayes Road in Goodmayes and Cranbrook Road in Gants Hill, and two ultra-rapid EV chargepoints in Ley Street, **while high demand exists along the Ilford High Street where majority of employment, businesses and popular destinations are located** (see Figure 5.2).

Figure 5.2. Demand for rapid charging overlaid with existing and planned EV chargepoints locations. Source: Steer



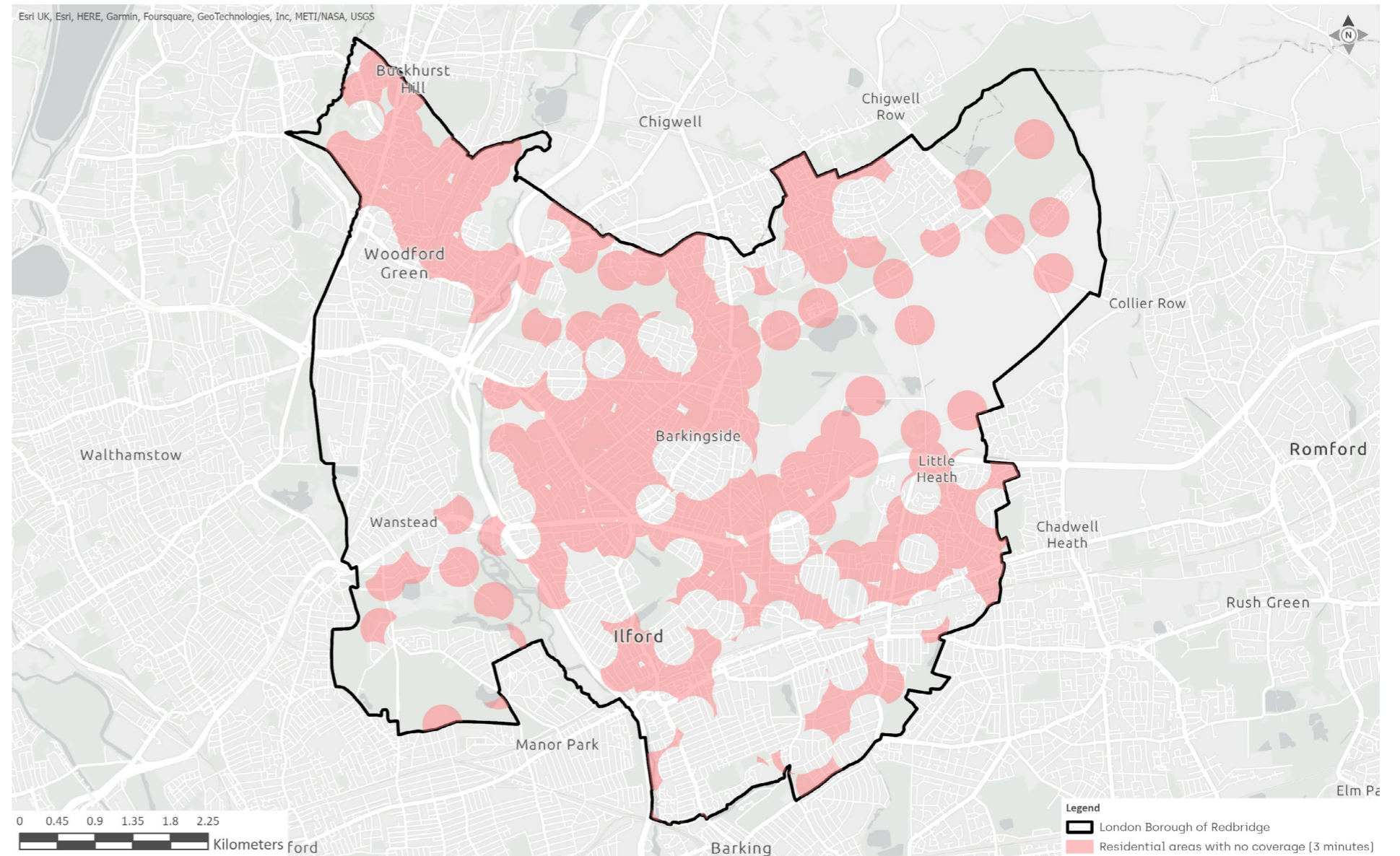
Equitable provision of charging infrastructure

We are committed to equity and inclusivity, and our chargepoint deployment strategy aims to ensure all residents of Redbridge have equitable access to EV chargepoints to support their transition to zero-emission vehicles.

When the 450 planned slow/fast EV chargepoints are delivered in 2024 (see Table 1.1), **two-thirds of Redbridge population** will have access to a chargepoint **within 5-minutes' walk** from their homes/place of residence.

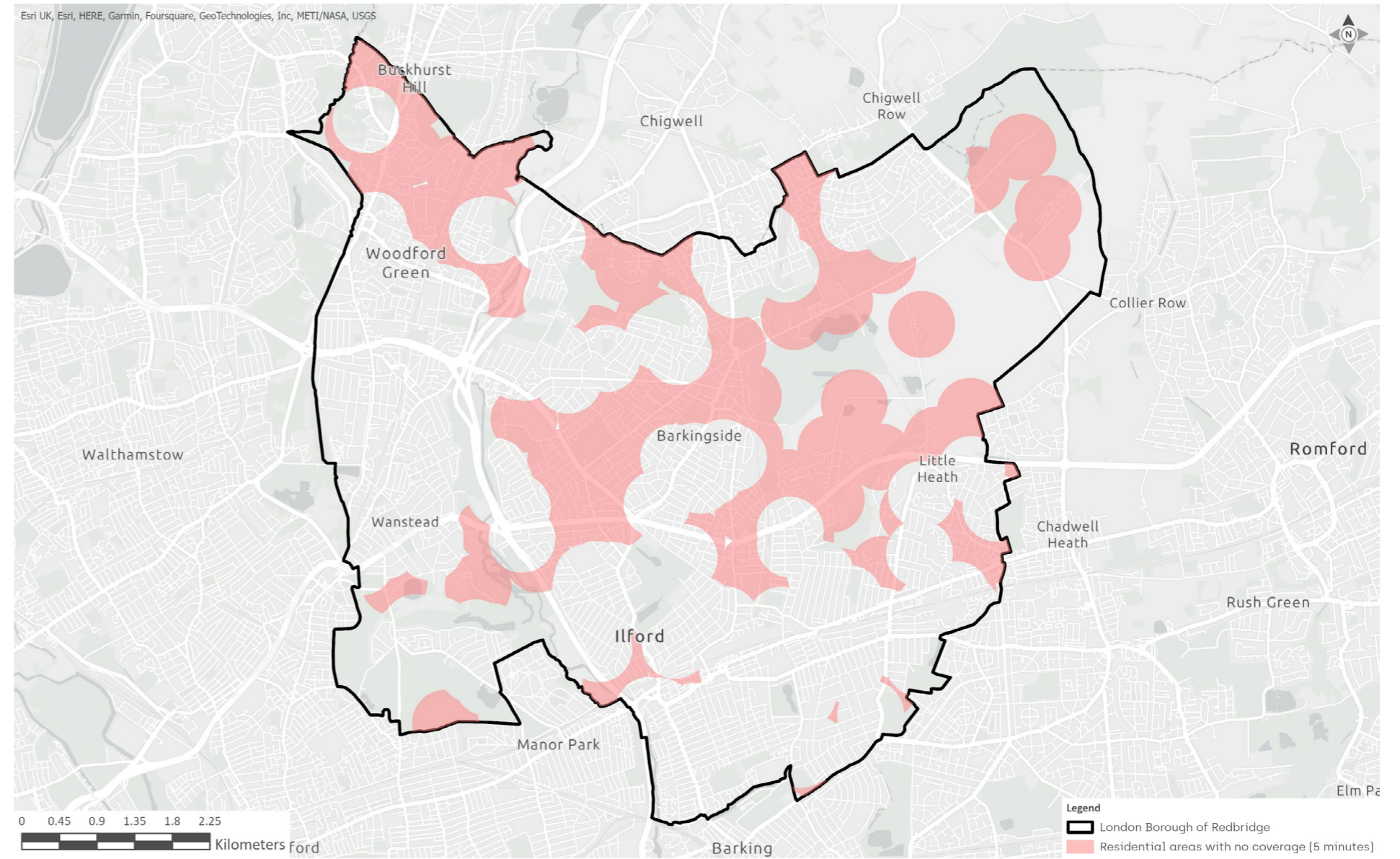
The area where additional EV chargepoints should be located to make the chargepoint network more equally distributed is represented by the highlighted area in Figure 5.3 and Figure 5.4.

Figure 5.3. Areas requiring additional EV chargepoints to provide access to all residents within 3-min walk. Source: Steer



Additional EV chargepoints will be needed in around **125 locations** for all residents to have an EV chargepoint within 3-min walk from their homes; and approximately 60 locations for 5-min walk.

Figure 5.4. Areas requiring additional EV chargepoints to provide access to all residents within 5-min walk. Source: Steer



6. Forecast EV Infrastructure Requirements

This Chapter presents the forecast number for anticipated EV growth and different types of EV chargepoints required to meet the growth.

EV growth

The Distribution Future Energy Scenarios 2020 (DFES) developed by the United Kingdom Power Network (UKPN) presents forecasts for EVs until 2050 at a local authority level. Based on a high scenario, Redbridge is predicted to have approximately 131,000 electric cars, 4,800 electric taxis and private-hire vehicles, and 10,000 electric vans by 2035.

The DFES forecasts for EVs in Redbridge are shown in Figure 6.1.

EV charging requirements

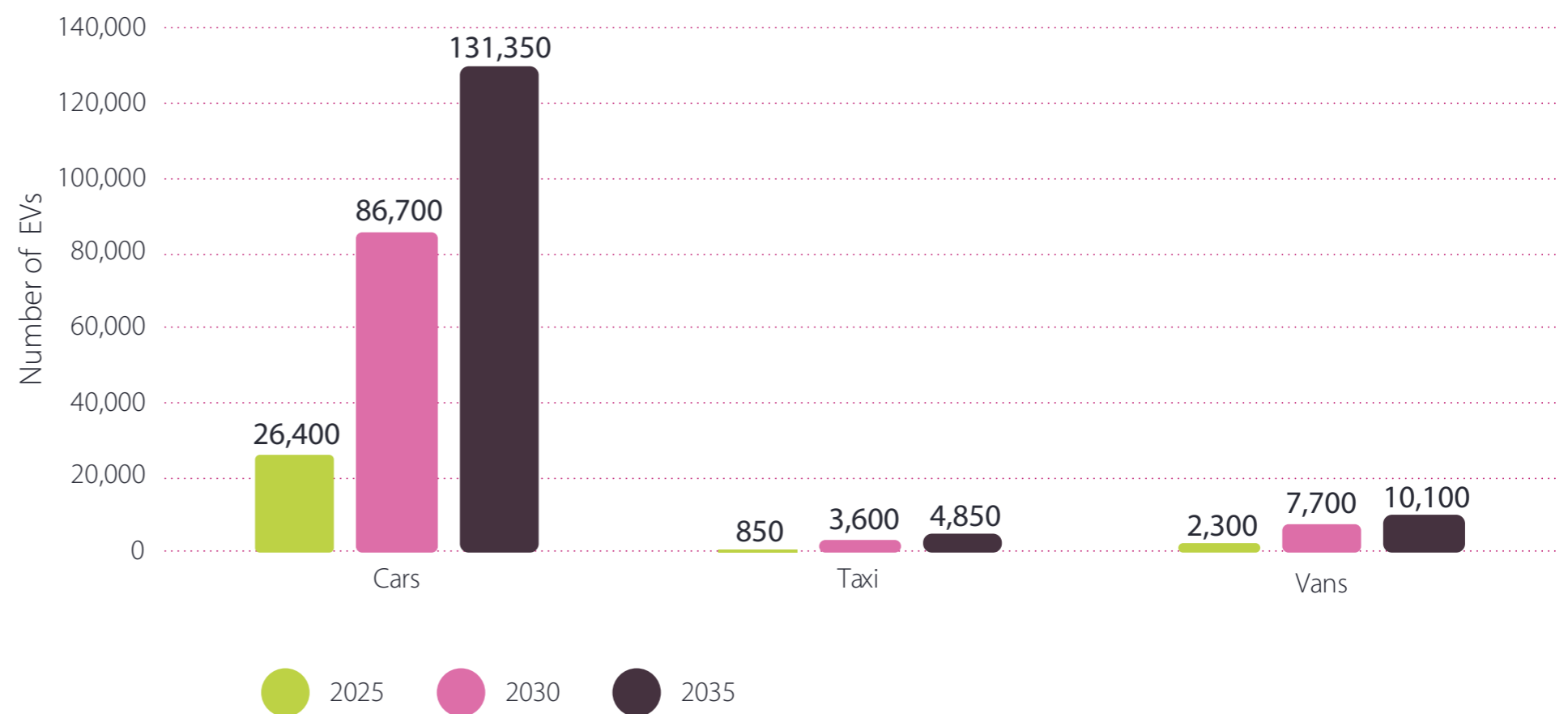
The International Council on Clean Transportation (ICCT) developed a robust methodology (see Appendix B for more information) to forecast the number of EV chargepoints required in the London Borough of Redbridge. We have used these forecasts to develop our aspirations for EV chargepoint growth in the borough.

The ICCT forecast considers six scenarios: three with an emphasis on rapid charging, destination charging and home charging for high EV sales; and three scenarios with the same emphasis but for low EV sales.²⁹

Of the six ICCT forecast scenarios, two more ambitious scenarios – “primary rapid charging emphasis” and “high sales residential charging” - are being considered by Redbridge as their aspirations, provision will be subject to engagement with EV chargepoint operators and availability of funding.

The ICCT forecasts for the required number of EV chargepoints in Redbridge are shown in the figures 6.2 and 6.3 below. The residential and destination EV chargepoints have the same technical specifications (7-22kW), the former represents overnight charging in residential areas and the latter represents the day charging at commercial or non-residential settings. Rapid EV chargepoints typically refer to charging capacity higher than 50kW.

Figure 6.1. Redbridge forecasts EVs by year and vehicle type. Source: DFES, UKPN³⁶



Redbridge ambitions up to 2026

By 2026, the borough aims to support the roll-out of up to (depending on funding availability and operators' interests):

- 40-50 public destination EV chargepoints;
- 20-50 public rapid EV chargepoints; and
- 1,200-1,650 public residential EV chargepoints.

Redbridge ambitions up to 2030

By 2030, Redbridge will consider supporting the roll-out of up to a total of:

- 100-110 public destination EV chargepoints;
- 30-90 public rapid EV chargepoints; and
- 1,950-2,750 public residential EV chargepoints.

Approximately 96% of these will be located in residential areas and the remainder in destinations such as council car parks, leisure centres and libraries.

Redbridge ambitions up to 2035

In 2035, the EV chargepoint infrastructure requirements will likely be significantly higher than in 2025. Redbridge will look to support the roll-out of up to:

- 155-160 public destination EV chargepoints,
- 30-110 public rapid EV chargepoints; and
- 2,300-3,300 public residential EV chargepoints.

More accurate EV chargepoint infrastructure requirements will be obtained by revisiting the actual uptake and forecasts in around 2030.

Please note, these are ambitions of Redbridge, and they will depend on funding availability and interests from private sector. Refer to Chapter 7 Action Plan for initial targets.

Figure 6.2. Redbridge forecast EV chargepoints Scenario 1: High sales residential charging. Source: ICCT

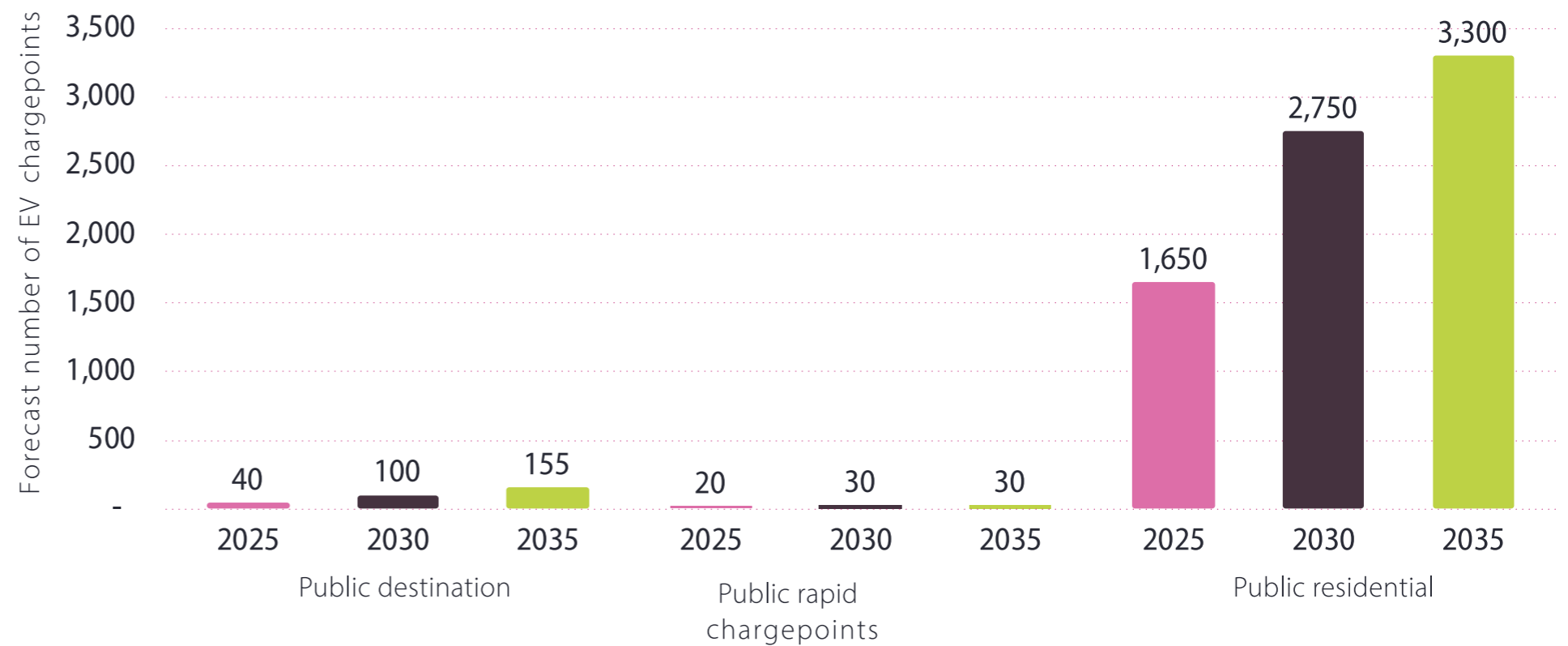
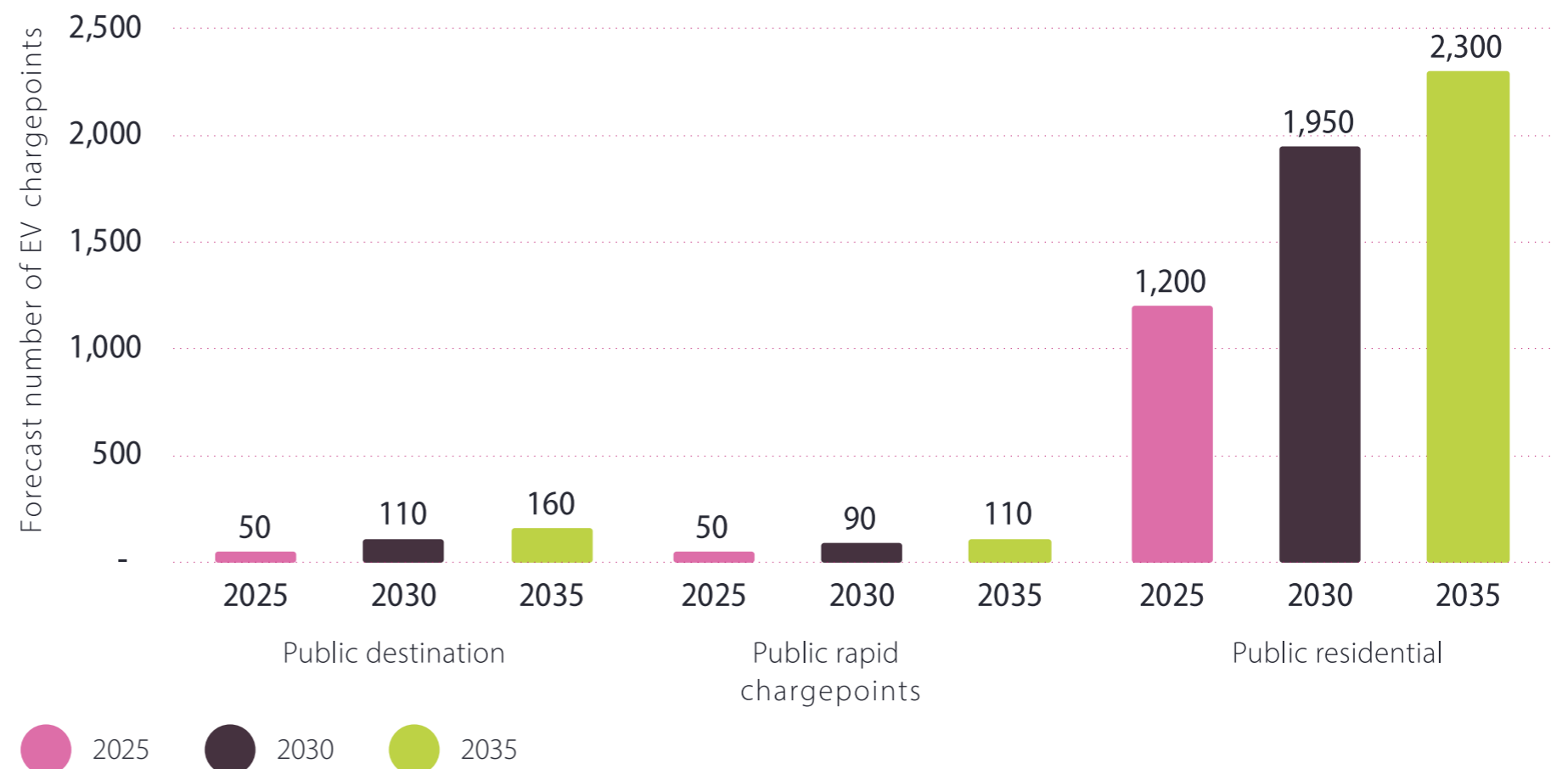


Figure 6.3. Redbridge forecast EV chargepoints Scenario 2: Primary rapid charging emphasis. Source: ICCT



7. Action Plan

This Chapter outlines how the EV Strategy will be delivered supporting achievement of the key objectives and realisation of the vision as set out in Chapter 3.

It presents a list of actions and interventions alongside a high-level implementation timeline.

Timeline


There are proposed actions for each objective which are categorised into four time frames: short-term (next 1-2 years), medium-term (3-5 years), long-term (6-10 years) and ongoing (with no end date) as shown in Table 7.1.




Table 7.1. Ongoing actions to support EV strategy objectives.

Objective	Description	Actions	Short-term (1- 2 Yrs)	Medium-term (3-5 Yrs)	Long-term (6-10 Yrs)	Ongoing	
1. Increase awareness and knowledge of EVs in the borough. 	Support residents, businesses and visitors in increasing their awareness of the environmental issues we are facing and improving their knowledge of EVs and infrastructure.	Working closely with the Redbridge Communications Team, develop the overarching stakeholder engagement plan on raising awareness about EVs including identification of local stakeholders (e.g. residents, taxi and PHV drivers, key businesses, accessibility groups), type and frequency of engagement and means of engagement.	●				
		Continue to use our existing web site as a platform to inform and signpost visitors to educational information on EVs and key activities in the borough.				●	
		(Co-)organise/support local engagement campaigns to encourage a transition to EVs and to understand where there is the greatest demand for charging.					●
2. Lead by example. 	Electrify our own fleet of vehicles and ensure our staff travel choices are environment friendly. We will use EV technology to reduce the environmental impact of our day-to-day operations and demonstrate positive behaviour.	Develop a phased fleet transition plan to move 100% of our fleet to zero emission in consideration of funding availability.	●				
		Working closely with the HR department, develop a staff travel plan to encourage sustainable travel behaviour, including use of EVs for all trips that need to be made by car or van.	●				
		Raise awareness of the council's own fleet electrification aims and progress towards full fleet electrification by 2030.			●		
		Ensure all councils' light vehicles are Net Zero, subject to funding availability. All new contracts with third party service providers will require Suppliers (as one of the Authority's lead partners) to have a Climate Emergency Plan and deliver a Net Zero contract by 2030. The Supplier will use only green renewable energy for the EV chargepoints certified as renewable through the redemption or purchase of Renewable Energy Guarantees of Origin (REGOs).				●	
		Key staff will maintain an up-to-date understanding of the EV infrastructure industry by attending industry webinars.					●





Objective	Description	Actions	Short-term (1- 2 Yrs)	Medium-term (3-5 Yrs)	Long-term (6-10 Yrs)	Ongoing
3. Develop a network of public EV chargepoints ensuring appropriate coverage of the right types of EV chargepoints across the borough 	Support the residents without access to EV charging in their houses with transition to EVs.	Ensure every resident is within at least a 5-minute walk of a chargepoint by 2026 (refer to Figure 5.3).	●			
	Provide different types of EV charging infrastructure which suit the diverse needs of the borough reflecting various housing type, demographics and transportation characteristics.	Collaborate with other London boroughs to develop an effective EV chargepoint procurement plan (which is scalable and with shorter timescales) such as for procurement of EV chargepoints using LEVI funding.	●			
		Continue to work with EV chargepoint operators such as BP to identify potential sites and deliver EV chargepoints on highway/non-council land.	●			
	Support businesses, taxi and PHV drivers and visitors and residents with options to charge or top-up their EVs quickly through rapid EV chargepoints roll-out.	Develop a prioritised roll-out plan for the procurement of EV chargepoints across Redbridge's car parks e.g. at leisure facilities and parks and at our housing estates, based on the underlying demand in the area (Refer to Figure 5.1 and Figure 5.2). Where available we will use utilisation data from existing EV chargepoints to assess demand for additional EV chargepoints in the area.	●			
		Support TfL's objective to roll-out rapid EV chargepoints in TfL owned sites and support joint-delivery of the hub's development throughout the borough. This will be achieved through updating each other on roll-out plans and undertaking joint site visits and site shortlisting.			●	
	Continue with the progress of installing additional EV chargepoints for residential use, including planned procurement of up to an additional 1,000 EV chargepoints using the LEVI funding based on underlying demand and residents' requests (refer to Figure 5.1 and Figure 5.2).				●	
	Provide residents and visitors with confidence by deploying banks of rapid EV chargepoints in hubs.					●
	Ensure every resident is within a 3 minute walk of an EV chargepoint by 2030 (see Figure 5.4).					●
At least 75 rapid or ultra-rapid EV chargepoints will be available across the borough by 2030.					●	



Objective	Description	Actions	Short-term (1- 2 Yrs)	Medium-term (3-5 Yrs)	Long-term (6-10 Yrs)	Ongoing	
4. Ensure our EV charging infrastructure network is inclusive, reliable and accessible 	Ensure a good minimum level of EV charging infrastructure provision and social equity to all residents, visitors and businesses.	For residential charging, ³⁰ assess and select solutions that integrate seamlessly into local streets, minimising disruption to pavement access. Where possible we will install lamp column EV chargepoints in clusters of at least two or three to ensure that EV chargepoints are easy to find and reserved for EV charging where possible.				●	
		Ensure public EV chargepoints on council land will be accessible 24 hours a day throughout the year and will be well lit.					●
		Ensure EV parking bays do not replace parking designated for people with a disability.					●
		Ensure EV charging bays in car parks are clearly marked and signposted. On-street EV chargepoints will be at least clearly signposted and can be marked particularly in areas where there is parking pressure and limited off street parking.					●
		Ensure access to EV charging bays are time limited, particularly to the rapid/destination EV chargepoints, so the vehicles are removed when the charging is completed emptying space for another vehicle that require charging.					●
		Ensure all new EV chargepoints support interoperability, including contactless payment. Through interoperability, EV drivers are able to find and use nearby EV chargepoints regardless of their network provider, which simplifies the user experience and helps assuage concerns about range and charging access.					●
		Continue to provide the online facility for residents to request EV chargepoints in their area and ensure that these requests are reviewed (against planned roll-out, wider demand analysis) and included in subsequent EV chargepoint procurement rounds. We will continue to respond to local demand and install in locations identified by residents and businesses while seeking to ensure good distribution across the borough.					●
		Ensure all new EV chargepoints meet the accessibility standards set out in BSI Electric vehicles – Accessible charging – Specification (PAS 1899:2022).					●
		Work in partnership with taxi and PHV operators and other stakeholders and review the evidence from existing electric taxi and PHV schemes to identify most advantageous locations where EV chargepoints can be installed to facilitate the usage of EVs by the drivers.					●



Objective	Description	Actions	Short-term (1- 2 Yrs)	Medium-term (3-5 Yrs)	Long-term (6-10 Yrs)	Ongoing	
5. Develop an EV charging infrastructure network which is sustainable economically, technically and fairly priced for users 	Future-proof roll-out of EV charging infrastructure in the borough. Encourage competitive pricing.	Develop and oversee contracts that ensure the charging network is reliable, well managed and maintained and that infrastructure is removed (and upgraded) if obsolete. Users should be able to report issues easily and these should be resolved promptly by the operators.	●				
		Continue to provide discounted permits to EV owners for EVs registered in the borough (subject to review).	●				
		Conduct a feasibility analysis on all council housing estates to develop a strategy to support electrification/EV uptake. The study will look at demand and review constraints.	●				
		Lobby for VAT changes to ensure 20% of council-owned parking spaces have charging facility by 2030. Angages to make charging electric vehicles more cost-effective for residents					
		Lobby for VAT changes to make charging electric vehicles more cost-effective for residents				●	●
		Engage with the industry to stay up to date on the latest developments in EV technologies and to review outcomes of pilots/trial of new technologies across the UK that may be appropriate for our area, e.g. a planned trial funded by LEVI across three East London boroughs to deploy EV chargepoints for disabled users or e-gullies.					●
		Engage with the UK Power Networks (UKPN) to review and address power connection constraints in the borough to support planned roll-out of EV chargepoints.					●
6. Facilitate a transition to EVs for both private and commercial users while encouraging walking and cycling and reducing car ownership and car mode share 	Enable more people to experience and use EVs without owning them. Support electrification of shared mobility in the borough.	Support electrification of car club fleet deployed in the borough by providing dedicated EV chargepoints in existing car club bays and working closely with the operator/s to identify new locations.	●				
		Assist in the development and promotion of electric car club schemes and their use, particularly for employers to reduce congestion in the borough (Redbridge Parking Strategy).				●	
		Work towards increasing the number of electric car club bays in the borough to promote the use of shared transport and support car sharing schemes and assist in the development of their use and work with employees to reduce congestion (Redbridge Parking Strategy).				●	
		Continue delivery of Mobility Hubs (such as the existing South Woodford and Wanstead Hubs) including EV chargepoints for use by shared cars, vans and public. This will be developed based on funding availability.				●	



Monitoring and evaluation

We will review and update the Strategy annually to ensure delivery of actions and targets. This will include sharing information and knowledge with other boroughs, and implementing lessons learnt.

We will assign action owners to monitor the progress of each action, and will collect the evidence on:

- **What actions have been delivered and with what outcome (e.g. carbon reductions);**
- **Who was involved in the delivery; and**
- **What was the impact on the Strategy and the objectives.**



Appendix A Demand Analysis Methodology

The key factors considered in the analysis and the reason for selection are presented in Table A.1 below.

Table A.1. Factors considered in underlying demand analysis for slow/fast and rapid charging

Factor	Reason for selection	Slow/fast Charging	Rapid Charging
Population	General residential demand – higher population represents a higher potential demand	✓	✓
Employment	General employment demand – higher employment represents a higher potential demand	✓	✓
UKPN DFES EV uptake Forecast ³¹	EV uptake by LSOA represents demand for charging	✓	
Mosaic – Target Population	Population group likely to use taxi/PHV apps (e.g. Uber, Gett)		✓
Car Ownership	Those with cars could potentially switch fuel type	✓	✓
Housing Type	Those without driveways (terraces / flats) are more likely to require on street charging	✓	
POIs (including car parks)	Locations where people may stop for multiple hours. Shopping districts, car parks or hospitals.	✓	✓
Charge point requests (residential)	a resident request means there could be demand. Note all these are not feasible locations to implement, they are considered to understand current demand	✓	
Committed and existing charge points (residential)	Demand is being met in these areas, hence a negative impact on the score and ranking of these areas	✓	
Footway crossings	Indicate properties with access to home charging, areas where public residential charging demand will be lower	✓	
Public Transport Accessibility Levels (PTAL)	Residents with limited/no access to Public Transport have higher potential to need to own a vehicle and need access to a charging infrastructure	✓	



Appendix B

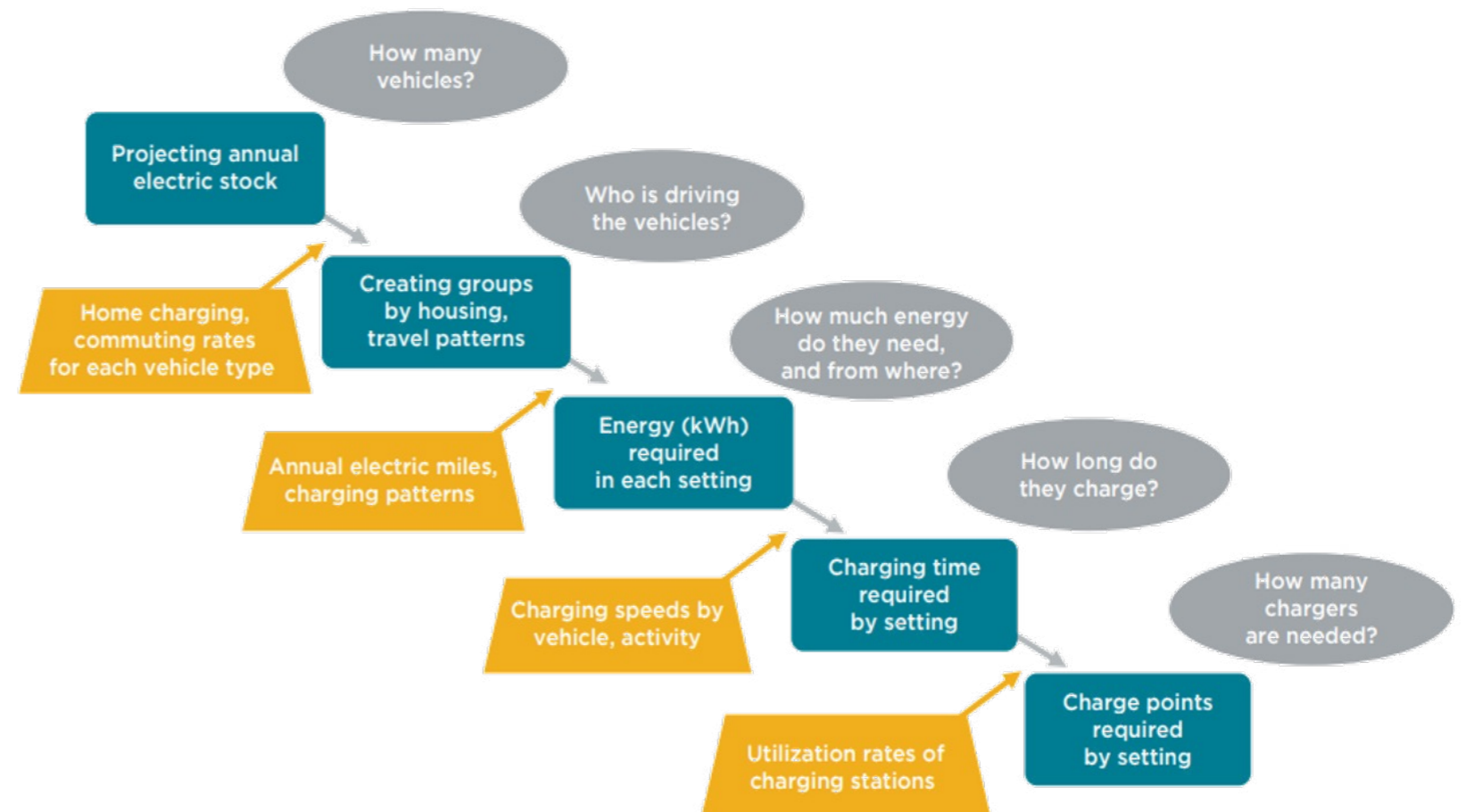
ICCT Chargepoint Forecast Methodology

The International Council on Clean Transportation (ICCT) utilises a robust methodology for chargepoint forecasts.³²

ICCT forecast includes the allocation of EVs to charging need groups based on vehicle type (BEV and PHEV), commuting status (2011 Census data) and home charging access (housing type).

The ICCT forecast is developed using pre-pandemic data from the following sources is used to develop the forecast: London Electric Vehicle Infrastructure Delivery Plan, Transport for London (TfL), London Datastore, UK Government and Office for National Statistics. Travel patterns were impacted during the pandemic and no post-pandemic travel data based forecasts were known at the time of writing this report.

Figure B.1. ICCT chargepoint forecast methodology. Source: Adapted from ICCT.



Endnotes

- 1 <https://www.gov.uk/government/news/uk-enshrines-new-target-in-law-to-slash-emissions-by-78-by-2035>
- 2 [Policies-for-the-Sixth-Carbon-Budget-and-Net-Zero.pdf](#)
- 3 <https://www.gov.uk/government/news/government-sets-out-path-to-zero-emission-vehicles-by-2035>
- 4 Department for Transport (2021), National Travel Survey Table NTS0908: Where vehicle parked overnight by Rural-Urban Classification of residence. Available at: <https://www.gov.uk/government/statistics/nationaltravel-survey-2020>
- 5 Borough Climate Action Plans and Targets | London Councils
- 6 Census 2021. How life has changed in Redbridge: Census 2021 (ons.gov.uk); Car or van availability - Office for National Statistics (ons.gov.uk)
- 7 VEH0142 Vehicle licensing statistics data tables - GOV.UK (www.gov.uk)
- 8 [lb-redbridge-local-implementation-plan-june-2019.pdf](#)
- 9 https://www.london.gov.uk/sites/default/files/the_london_plan_2021.pdf
- 10 UK car market Europe's pioneer for electric-car adoption | Autovista24 (autovistagroup.com)
- 11 Road Tax on Electric Cars | Pod Point (pod-point.com)
- 12 Scrappage schemes - Transport for London (tfl.gov.uk)
- 13 Why buy an electric car? | YouGov <https://yougov.co.uk/topics/travel/articles-reports/2020/09/30/why-buy-electric-car>
- 14 CK Electric Vehicle Research Report.pdf (greenfleet.net)
- 15 Over half of younger drivers likely to switch to electric in next decade - Office for National Statistics (ons.gov.uk): Adults in Great Britain surveyed by the Opinions and Lifestyle Survey (OPN) between 22 September and 3 October 2021
- 16 Conducted by Ipsos MORI which included a representative sample of 3,404 UK residents with a full driving licence; <https://www.rsc.org/news-events/articles/2021/nov/evs-survey/>
- 17 <https://cleantechnica.com/2022/07/07/have-electric-vehicles-reached-parity-with-their-ice-counterparts/>
- 18 Over half of younger drivers likely to switch to electric in next decade - Office for National Statistics (ons.gov.uk)
- 19 On Street Charging (acceleratedinsightplatform.com)
- 20 <https://co-chargepoint.com/>
- 21 <https://www.justpark.com/ev/justcharge>
- 22 About - WiCET
- 23 Gul-e EV charging solution trialled in Oxfordshire - transportandenergy
- 24 London is getting slick EV chargepoints that vanish when not in use (thenextweb.com)
- 25 Flat and Flush Trojan Energy EV chargepoints go live across London - Trojan Energy
- 26 Flat and Flush Trojan Energy EV chargepoints go live across London - Trojan Energy
- 27 Pop-up EV charging hubs deemed a success in UK trial (greencarreports.com)
- 28 An hexcell represents an area of 500m in width
- 29 Fulfilling electric vehicle charging infrastructure needs in Greater London and its boroughs (theicct.org)
- 30 Residential charging refers to on-street EV chargepoints on public/council land for residential use. This does not include home based EV chargepoints on private properties.
- 31 adapted from the National Grid, Distributed Future Energy Scenarios by Element Energy in consultation with a range of local government stakeholders. The full methodology can be seen on the UKPN website.
- 32 Fulfilling electric vehicle charging infrastructure needs in Greater London and its boroughs (theicct.org)
- 33 Borough Climate Action Plans and Targets | London Councils
- 34 <https://transportandenergy.com/2022/03/04/gul-e-ev-charging-solution-trialled-in-oxfordshire/>
- 35 <https://www.transportxtra.com/publications/local-transport-today/news/71759/gul-e-electric-vehicle-charging-scheme-trialled-in-central-bedfordshire/>
- 36 UK Power Networks Innovation - Distribution Future Energy Scenarios 2020



Redbridge Electric Vehicle Strategy (2024 — 2033)

March 2024