Bristol Electric Vehicle Charging Infrastructure (EVI) Strategy

2026-2036

BRISTOL CITY COUNCIL

Glossary

BCC Bristol City Council.

BCL Bristol City Leap.

CAZ Clean Air Zone (CAZ) refers to dedicated areas within the UK where there is targeted action to improve air quality. The Bristol CAZ charges more polluting vehicles that drive through the city centre, including cars, taxis, vans, light goods vehicles, buses and HGVs. It covers roads in the city centre and operates 24 hours a day, 365 days a year.

CPO Charge Point Operator (CPO) is a private entity that supplies, installs and operates the Electric Vehicle Infrastructure.

CPZ Central Parking Zone (CPZ), also known as Controlled Parking Zone, is a zone in the city centre where parking controls are in place, with parking permits limited to local businesses and residents. This is separate to the Residents' Parking Scheme (RPS) area.

DfT Department for Transport.

DNO (electricity) Distribution Network Operator.

EV Electric Vehicle (EV) is a vehicle that is powered by an electric motor only and the vehicle is charged by plugging it into an external electric power source. They are also known as Battery Electric Vehicle (BEV) in the UK.

EVI Electric Vehicle charging Infrastructure (EVI), also referred to as chargers and charge points, are the infrastructure for charging an EV. For the purposes of this study, a charge point represents one EV charging socket.

The duration to fully charge EVs through different types of EVI vary depending on the capacity of the charge points.

AC EVI – Alternating Current EVI are typically low powered EVI with capacity to add up to 40 miles of range per hour to EVs. They can supply up to 22kW of power per hour. AC chargers could be slow (typically 3-7kW) or fast (7-22kW). In the document, all AC charge points are referred to as 'Standard' charge points with capacity up to 22kW, if not otherwise specified as slow (3-7kW) and fast (7-22kW).

DC EVI – Direct Current EVI are typically high powered EVI with capacity to charge an EV up to 80% in 20 minutes or less, depending on the capacity of the charger and vehicle battery size. They can supply a minimum 50kW power per hour. DC chargers can be rapid (typically 50-100kW) and ultra (150kW+).

GRF Green Recovery Fund.

kW Kilowatt of power.

LEVI Local Electric Vehicle Infrastructure

ORCS On-street Residential Charge point Scheme.

OZEV Office for Zero Emission Vehicles.

PHEV A plug-in hybrid electric vehicle (PHEV) is a vehicle that is propelled by an internal combustion engine (petrol/diesel) and an electric motor. The battery is charged when the fuel is used or by connecting to a mains electricity supply. This significantly reduces use of petrol or diesel consumption by the vehicle.

RPS Residents' Parking Scheme (RPS) is a scheme that applies to areas within the city where residents require parking permits to park their vehicles in the area. Some visitor permits can also be applied for. It easier to obtain a resident permit in RPS than in Central Parking Zone (CPZ), also known as Controlled Parking Zone in the city centre.

WECA West of England Combined Authority.

ZEV Zero Emission Vehicle (ZEV) refers to a vehicle that does not emit exhaust gas or other pollutants from the onboard source of power.

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Foreword

We are delighted to present Bristol's Electric Vehicle Infrastructure Strategy — a major step towards creating a cleaner, fairer and more sustainable city.

The strategy sets out how we will deliver a well distributed, accessible and reliable charging network that supports all communities, while also encouraging a shift towards more efficient travel behaviours including car clubs and journey sharing.

Our priorities include expanding residential charging, particularly for households without off street parking, and delivering a consistent, affordable user experience across the city.

This work reflects significant collaboration across the council and with our partners. It recognises that, while electric vehicles are an important tool for reducing emissions, they are only one element of a wider, long term plan to transform how Bristol moves. By supporting public transport, active travel and shared mobility alongside EV adoption, we are shaping a transport system that is resilient, inclusive and ready for the future.

Working closely with partners such as Bristol City Leap, the West of England Combined Authority and commercial providers, and drawing on a blend of public investment and private funding, we will enable a network that supports everyday journeys, reduces emissions and underpins Bristol's wider climate ambitions. Together, we are building an EV ready future for everyone.

Councillor Ed Plowden
Chair of the Transport and Connectivity Policy Committee

Councillor Martin Fodor
Chair of the Environment and Sustainability Policy Committee

Executive Summary

Vision

Our Vision for Bristol is to:

'Facilitate a smooth transition to electric and low carbon forms of transport by investing in the development of a network of public electric vehicle charging infrastructure that is fairly distributed across the city, is accessible, reliable, affordable and is well integrated with private infrastructure of residents and businesses. At the same time, acknowledge that the promotion of active, public and shared forms of transport remain the priority for alleviating congestion, reducing carbon emissions and improving health outcomes'.

The UK government has committed to **end the sale of all new petrol and diesel vehicles by 2035** and envisages that by 2030, '*everyone should have access to reliable Electric Vehicle (EV) charge points through inclusively designed public charging and effortless on and off-street charging solutions.*'

The Bristol Electric Vehicle charging Infrastructure (EVI) Strategy (also referred as the 'Strategy') has been developed to set out the Council's vision, objectives and an action plan to develop an EV charging network which is fit for use in the city and informed by a robust forecast for charge point requirements. The Strategy also sets out a framework for how the Council will work with its partners to deliver the EV charging network.

Strategic Principles for EVI Development

Objectives

In alignment with the above strategic principles, five core objectives have been developed for the Strategy, as presented in Figure Exec.1.

Figure Exec.1: Objectives of the Bristol EVI Strategy 2026-2036

1. Deliver a high-quality and accessible charge point network

2. Deliver a consistent, reliable, and fair user charging experience

3. Deliver a commercially sustainable charge point network that harnesses and reinvests private funding

4. Ensure the charge point network is future proofed, can meet demand and prioritises residents who do not have access to off-street parking.

5. Continue to invest in alternatives to private car use

EV Adoption in Bristol

The number of EVs registered in Bristol has been growing steadily since 2020 due to increasing consumer confidence, availability and affordability of vehicles, supported by an expanding charge point network.

It is estimated that there will be about 15,000 EVs in Bristol in 2027, increasing to 40,000 in 2030 and reaching 120,000 by 2036, accounting for over 50% of total registered vehicles in the city. By 2050, over 99% of registered vehicles in Bristol are expected to be EVs.

Forecasts for EV Charge Points in Bristol

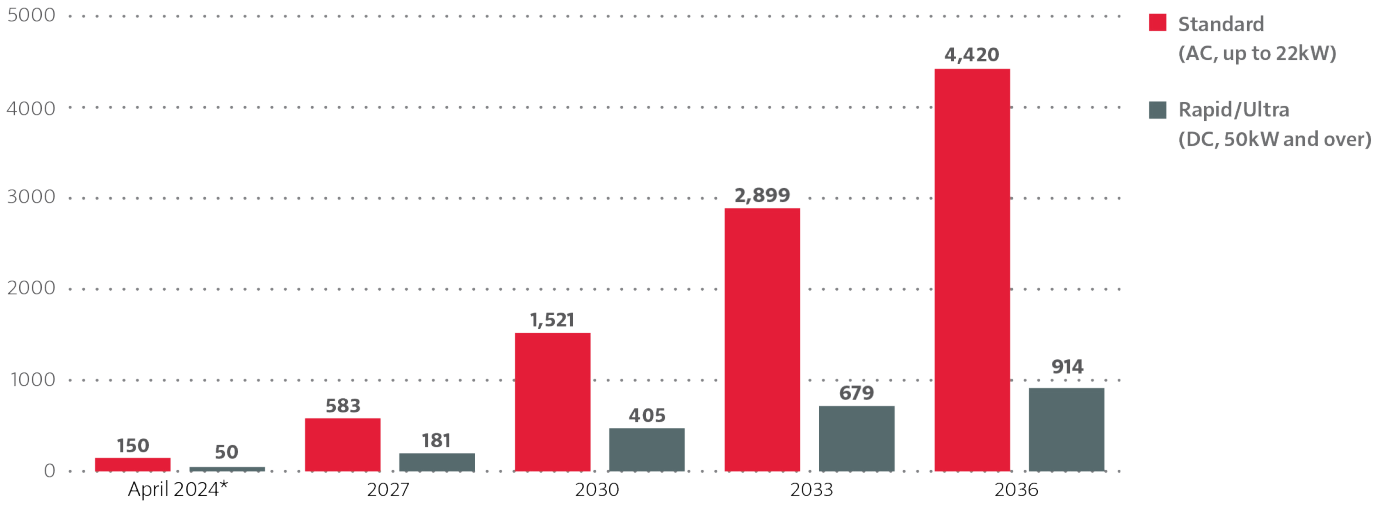
The early adopters of EVs have been households and businesses with access to private charging (home/depot charging) who are not reliant on the public charge point network to meet the majority of their EV charging needs. In order to support and encourage a transition to EVs for residents or businesses who do not have access to private parking, a reliable public EV charging network is required alongside cross pavement charging, which is being trialled in Bristol from 2026.[1]

Modelling future EV charging demand forecasts that, **in a most likely scenario, about 800 charge points will be needed in Bristol by 2027 to meet the demand for charging from increased EV adoption. This represents an additional 600 charge points to the existing 200 charge points in the city.**

A significant number of these charge points will be delivered on public highways and other public land, but the expectation is that some of this demand will also be met by new developments and private landowners such as supermarkets. Plans for delivering a public EV charging network will consider the existing public and private provision, to ensure that areas are not overly saturated with charge points.

In partnership with Bristol City Leap (BCL) or a commercial partner, Bristol City Council (BCC) plans to deploy up to 1,000 slow/fast (up to 22kW) and 15 rapid (50-100kW) charge points utilising WECA's Green Recovery Fund and the Department for Transport's (DfT's) Local Electric Vehicle Infrastructure (LEVI) fund on public highways and council land by 2030.

Figure Exec.2: Potential number of public charge points needed in Bristol to meet forecast demand by charge point type



** Based on ZapMap data on all publicly available charge points on both council and private land such as supermarkets*
Source: Steer analysis

[1] Please note, the trials of cross-pavement charging will be conducted on a full cost recovery basis e.g. at no cost to the council.

Relative Demand for EV charging in Bristol

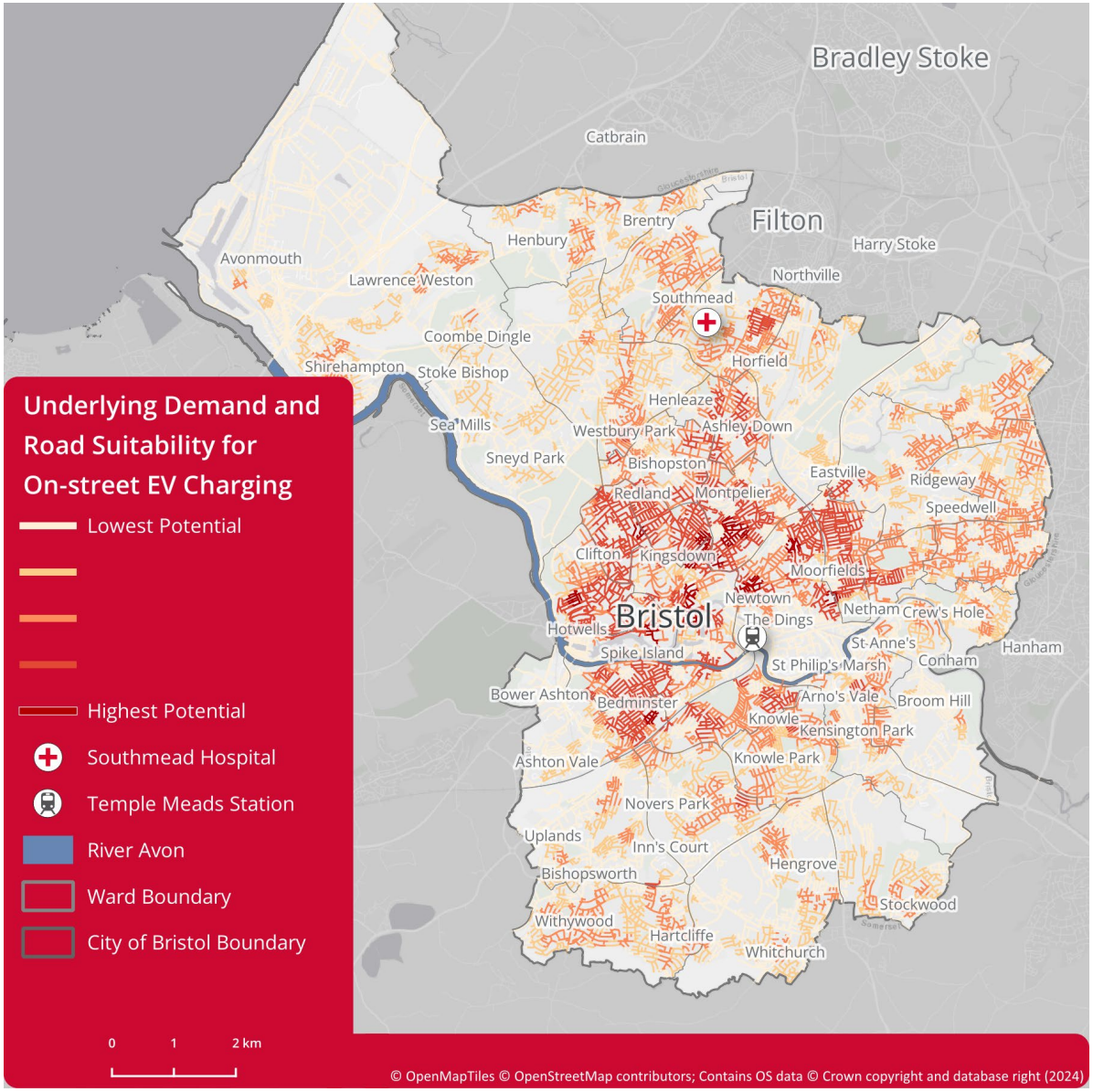
The council plans to develop a public EV charging network in Bristol based on where charging is needed most. An analysis of population, car ownership, traffic flow and other socio-economic factors that affect demand for EV charging across Bristol shows that:

- Demand for residential charging (typically using up to 22kW charge points) is highest in the city centre area, the inner urban area; and
- The highest potential for top-up charging (typically using 50kW and over charge points) is around Bristol Temple Meads connecting to the city centre, and along the A4032 up to Eastville Park. There is also high potential on the M5 and M49 in Avonmouth.

Road Suitability for On-street EV Charging in Bristol

The map in Figure Exec.3 presents relative potential to deploy on-street residential charge points (typically up to 22kW) across the city. The darkest (red) roads have both higher relative demand and are relatively more suitable for EVI deployment due to the road conditions. This includes the city centre and inner urban area.

Figure Exec.3: Bristol underlying demand and road suitability for on-street EV charging



Source: Steer analysis

Actions

A set of actions has been developed to meet the objectives of this Strategy. These actions are informed by an analysis of forecast uptake of EVs, corresponding demand for charge points and a location assessment.

Bristol City Leap (BCL)

Bristol has a unique position in developing green infrastructure in the city. BCL, an innovative 20-year partnership between BCC, Ameresco UK and Vattenfall Heat UK, was launched in 2023 to enable the delivery of over £1 billion of investment into Bristol's energy system, supporting decarbonisation of the city, including EV charging infrastructure development.

BCC can leverage this partnership to set up EVI contracts that are aligned to the objectives and principles of this Strategy. This partnership offers BCC an advantage in expanding its EVI network quickly and efficiently.

By 2027

- Lead on the deployment of on-street 3-5kW charge points prioritising areas without access to off-street parking/charging, utilising Green Recovery Fund (GRF).
- Seek private sector funding to deliver charge points in relatively high demand areas.
- Working alongside West of England Combined Authority (WECA) and Office for Zero Emission Vehicles (OZEV) develop an EVI procurement plan that attracts private sector investment into EVI across the region.
- Ensure that revenues generated from commercial arrangements with charge point operators cover the costs of managing the contracts, while ensuring performance requirements are met.
- Investigate requiring new housing developments whose residents would require on-street parking to pay an EV charge point levy for on-street EVI development. This is already a requirement for new developments with off-street residential parking.
- Facilitate a trial of cross-pavement EV charging by residents who have access to on-street parking adjacent to their homes (subject to feasibility), and develop a policy based on lessons learnt from the trial.

By 2030

- In collaboration with WECA, lead delivery of charge points in low demand and deprived areas utilising the LEVI fund, ensuring provision of public EV charging in areas which are otherwise less commercially viable.
- Deliver EV charge points across BCC car parks and ensure they are available 24/7 and are well lit and accessible by all users.
- Attract private sector funded deployment of rapid EV charge points across the city, focussing on key transport corridors and other high demand areas.
- Enable all taxis and private hire vehicles to be zero emission by facilitating deployment of rapid charge points in key locations where the vehicles are parked.
- Support electrification of car clubs in the city by deploying dedicated charge points for electric car club vehicles at strategic locations.

These actions will be monitored to assess the progress made. This includes:

- Quarterly/Annual review of EV adoption in Bristol using GOV.UK data on vehicle statistics
- Quarterly/Annual review of growth in EVI provision using ZapMap data and data reported by BCL/commercial partner on charge point availability and usage
- Development of a Yearly Performance Report reviewing progress on delivery of the actions in this Strategy against the agreed timescales

→ A detailed Action Plan is presented in Chapter 6.

1 Introduction

Context

Bristol was the first local authority in the UK to declare a climate and ecological emergency, and pledged to reach net zero emissions by 2030. Decarbonisation of road transport is key to achieving this goal.

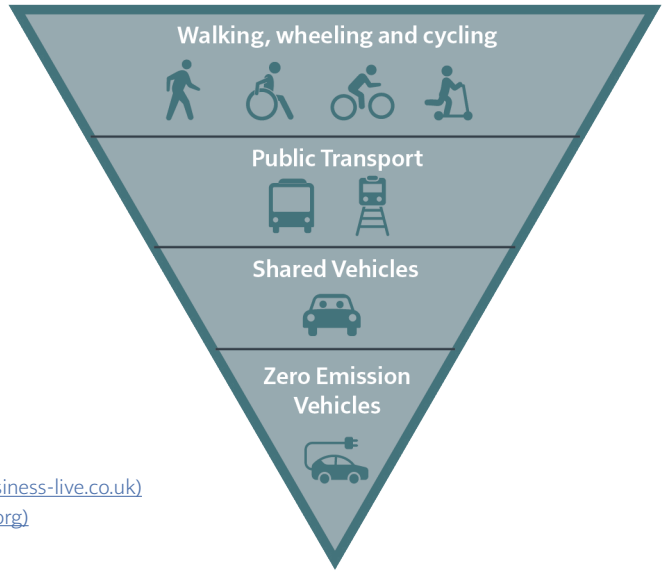
Bristol is the 8th largest city in England and Wales with a population of 483,000 (mid 2023).[1] Over the last decade (2013-2023) the population has grown by 10%, making Bristol the second fastest-growing city in the UK. The city's economic growth in the next five years is likely to significantly outpace the rest of the UK with an expected 6% increase in new jobs, driven by a thriving science, technology and knowledge industry.[2] This is expected to increase car ownership and use in the city, making it difficult to meet the city's net zero ambitions by 2030, unless interventions are developed.

In 2023, there were approximately 222,000 registered vehicles in Bristol. Vehicle ownership in Bristol is relatively low at 445 cars/vans per 1,000 inhabitants (2011) compared to the England and Wales average of 491 cars per 1,000 inhabitants.[3] However, over the past decade, the number of new vehicles registered has steadily increased, in line with population growth and rising incomes.[4] Travelling by car remains the most common mode for commuting in Bristol, accounting for a 53% commuting mode share. In addition, a significant number of people commute to work in Bristol by car from neighbouring areas adding to its transport emissions.[5]

Bristol's overall goal is to increase the use of sustainable transport and reduce vehicle miles by 40% by 2030 (See Figure 1.1).[6] For trips that must be made by car or van, switching to EVs will help significantly reduce tail-pipe emissions and contribute to addressing the climate emergency. While investment in electric vehicles is required, the strategy acknowledges that the priority remains the promotion of public and active modes of transport. EVs will support the decarbonisation of the transport network and provide some air quality improvements, but they do not explicitly support other objectives such as tackling congestion, improving health outcomes and enhancing biodiversity.

The Bristol One City Climate Strategy aims for 100% of Bristol's cars and 90% of remaining vehicles to be ultra-low emission by 2030.[7]

Figure 1.1: Transport hierarchy in Bristol



1 Population of Bristol
2 Bristol economy expected to grow faster than rest of UK - Business Live (business-live.co.uk)
3 Car ownership rates by local authority - december 2012.pdf (racfoundation.org)
4 Vehicles statistics - GOV.UK (www.gov.uk)
5 Bristol Transport Strategy (bristol.gov.uk)
6 Bristol One-city Climate Strategy (2020)
7 Bristol One-city Climate Strategy (2020)

Purpose of the Strategy

The UK Government has committed to end the sale of all new petrol and diesel vehicles by 2035. The UK's Office of Zero Emission Vehicles (OZEV) has cited the pivotal role local authorities need to play in facilitating the uptake of EVs that will be fuelled by a ban on petrol and diesel cars in 2035 and the Zero Emission Vehicle (ZEV) mandate, which includes development of a local EVI Strategy.

The Bristol EVI Strategy (also referred to as the 'Strategy') has been developed to set out the BCC's vision, objectives and an action plan to develop an EVI network to support the transition to EVs. This is informed by a robust forecast for public EVI requirements and an analysis of demand across the city.

It has been developed in close alignment with WECA strategies and plans, including WECA's EV Action Plan [1]; while also considering Bristol's local context.

The Strategy is informed by engagement with the BCC's internal teams including Highways, Parking, Fleet, Council Estates, as well as key stakeholders.

1 https://www.westofengland-ca.gov.uk/wp-content/uploads/2023/07/3069.-EV-Action-Charging-Plan_v8.pdf?trk=organization_guest_main-feed-card-text

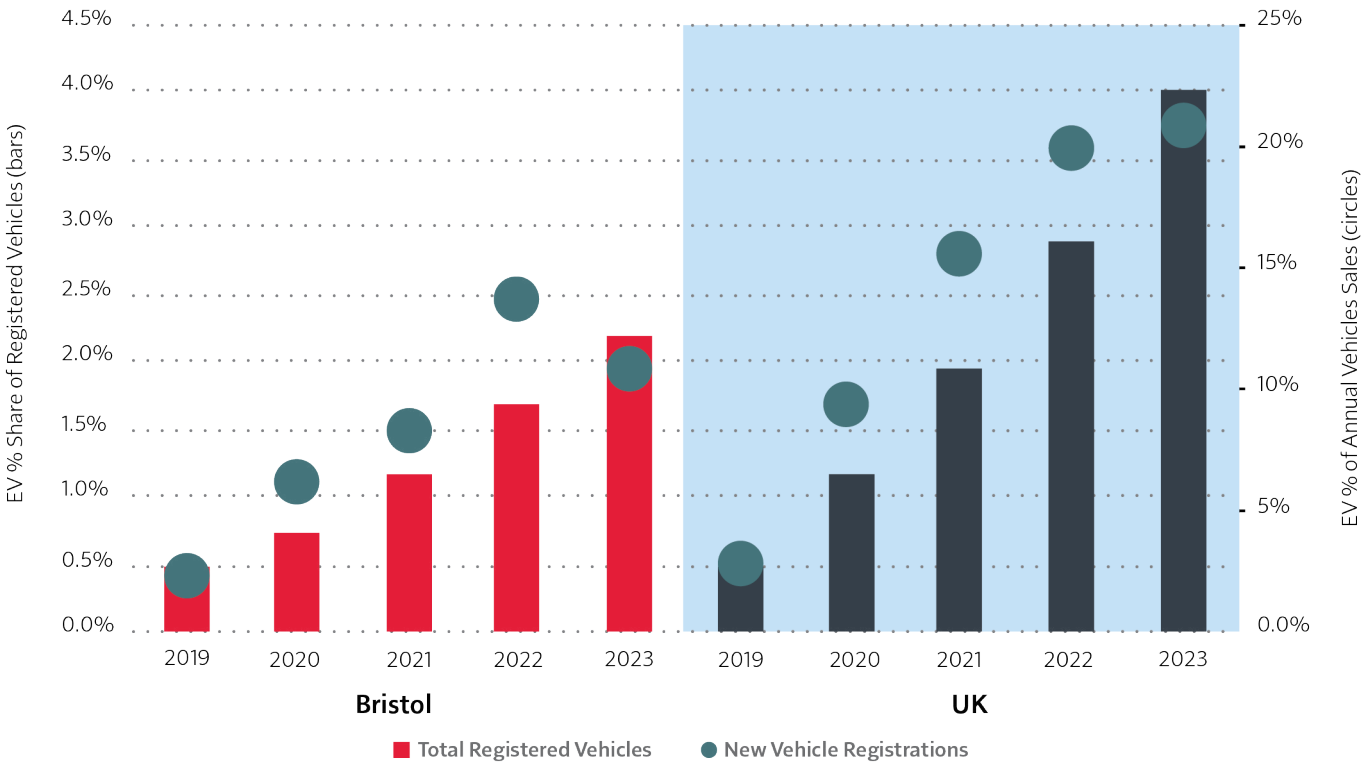
EV Adoption in Bristol

Like the rest of the UK, EV adoption in Bristol has been increasing steadily since 2020, and electric cars have shown much greater adoption than electric vans.

However, EV uptake in Bristol so far has been slower than the UK average as demonstrated in Figure 1.2. Of Bristol's 220,000 registered cars and vans at year-end 2023, only 2.2% were EVs (about 4,900 vehicles) compared to 4% across the UK. In Bristol, EVs accounted for about 11% of new car and van registrations which is also about half of the UK's average at 20%.

Through this Strategy, BCC wants to support a faster transition to EVs by increasing the number of charge points based on a review of when, and where they are needed the most.

Figure 1.2: EV uptake in Bristol compared to the UK



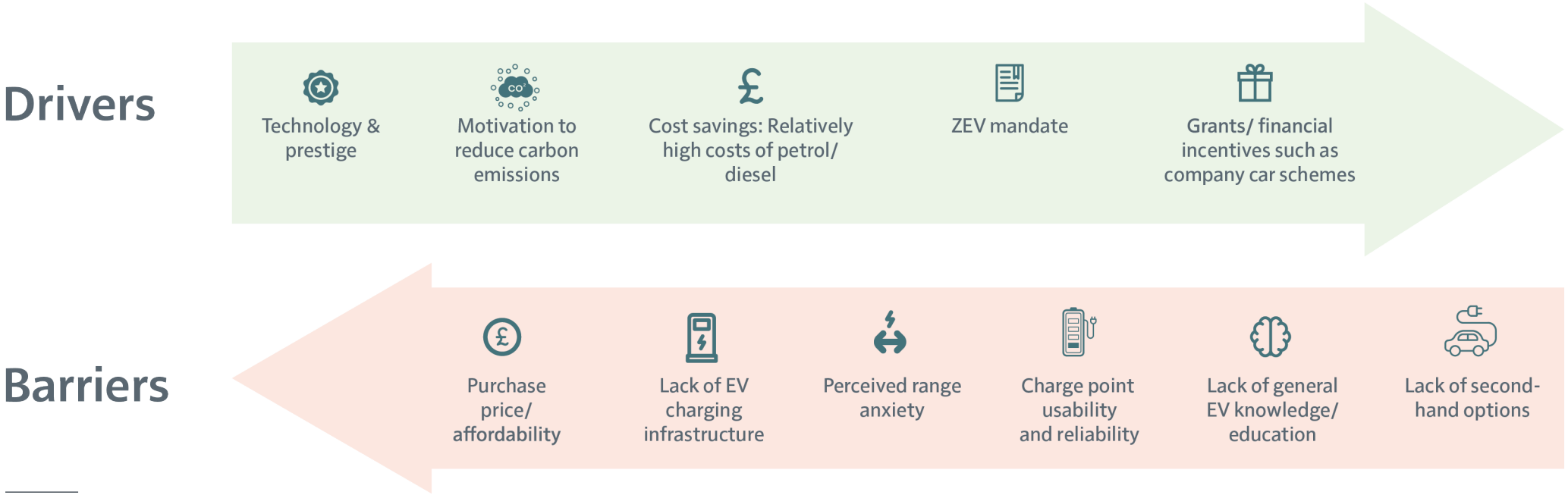
Source: Department for Transport, Vehicle Statistics

Drivers and Barriers to EV Adoption

Affordability and insufficient financial incentives[1], along with perceived range (or charger) anxiety have been the key barriers to EV adoption in the UK. However, consumer confidence in EVs is growing. A 2022 survey by Ernst and Young (EY) including 13,000 respondents from 18 countries, including the UK, cited that 20% of car buyers would prefer an EV for their next vehicle purchase, rising to 31% when including Plug-In Hybrids.[2]

A 2023 survey of over 1,600 EV users in the UK by EVA England cites that 91% of EV drivers have no intention to return to a petrol or diesel car. Furthermore, 86% of EV owners have found owning an EV is cheaper to run.[3]

Figure 1.3: The perceived drivers and barriers to EV adoption in the UK



Source: Steer analysis

1 A list of available funding options is included in Appendix C.

2 EY Mobility Consumer Index 2022 study

3 EV drivers overwhelmingly positive about switch, finds EV driver survey | EVA England : EVA England

Addressing some of the barriers

To facilitate a smooth transition to ZEVs and incorporate the ban on petrol and diesel vehicles effectively in the UK by 2035, the DfT has introduced a ZEV Mandate, which became law in January 2024. The mandate sets annual targets for vehicle manufacturers on the proportion of vehicles they sell that have to be ZEV (see Table 1.1 below). This is expected to encourage vehicle manufacturers to innovate and introduce a wider range of EV models to the market, making them more accessible and affordable.

The mandate states that 38% of cars sold in the UK in 2027 must be ZEVs. For comparison, the proportion of EVs sold in 2023 was 20% (in Bristol, the share of EVs in total vehicles sold was around 11% in 2023). The mandate then rises sharply to 80% in 2030 in order to reach 100% by 2035. These are national targets, the regional and local trajectories are likely to vary, based on current EV adoption rate, population propensity to buy an EV and growth in charge point accessibility.

Table 1.1: Annual targets for ZEV sales share across the UK until 2035[1]

ZEV Mandate on EV share within New Car and Van Sales												
Year	**2024**	**2025**	**2026**	**2027**	**2028**	**2029**	**2030**	**2031**	**2032**	**2033**	**2034**	**2035**
Cars	22%	28%	33%	38%	52%	66%	80%	84%	88%	92%	96%	100%
Vans	10%	19%	22%	34%	46%	58%	70%	76%	82%	88%	94%	100%

Source: Department for Transport

1 Consultation on a zero emission vehicle (ZEV) mandate and CO2 emissions regulation for new cars and vans in the UK, March 2023, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1154610/zev-mandate-co2-emissions-regulation-consultation-document.pdf

While the ZEV Mandate compels uptake, a few key factors influence consumer preference for EVs in the short term, which are presented below:

- **Affordability:** High purchase price is a commonly cited barrier to EV adoption. Many consumers focus on high upfront costs of EVs but often overlook the potential lower running costs. Lack of awareness around Total Cost of Ownership (TCO) is a common misconception. Typically, EVs have on average 30% lower maintenance costs than their diesel or petrol counterparts. In addition, upfront costs for EVs are gradually declining due to advancements in battery technology and are expected to be comparable to diesel and petrol vehicles as the industry starts mass production in the short term.
- **EV Infrastructure:** The UK Government has ambitious plans to grow public EV charging infrastructure, including an objective to have over 300,000 EV charge points across the UK by 2030.[1] This will support adoption of EVs amongst users who are concerned about charging their vehicles during long distance trips.
- **Perceived range anxiety:** The average EV on the road today can travel between 100 to 300 miles on a single charge, depending on the vehicle model. This means, on average, a driver in the UK needs to charge their vehicle only once per week and not every day as is commonly referenced.
- **Charge point usability:** The UK Government's Public Charge Point Regulations which came into force in November 2024[2] aim to improve pricing metrics, payment options (contactless and roaming) and reliability. However, a competitive landscape amongst the EV charge point operators is already driving provision of more reliable, accessible, and fairly priced charge points.
- **EV knowledge and education:** As EV adoption increases, it's important for consumers to be informed about the benefits of EVs, different models, and how to transition from petrol and diesel vehicles. Websites such as ZapMap, Fully Charged Show, along with the regional Go Ultra Low West (GULW), and the UK Government's OZEV official websites offer resources to help consumers understand the long-term financial and environmental benefits of EVs, and provide information on available models and government incentives.
- **Second-hand EV options:** The market for second-hand EVs is growing rapidly, offering more affordable options for those who are interested in switching to electric but may not want to invest in a brand-new vehicle. As the market matures, the availability and affordability of quality second-hand EVs will continue to increase, making it easier for consumers to enter the EV market without the high purchase price of new models.

1 Taking charge: the electric vehicle infrastructure strategy (publishing.service.gov.uk)

2 https://www.gov.uk/government/publications/the-public-charge-point-regulations-2023-guidance/public-charge-point-regulations-2023-guidance

Policy Commitments

National, regional and local policies all highlight the importance of EVs in tackling transport emissions and achieving carbon reduction targets. Key policies influencing the EVI Strategy are summarised below.

National

The UK Government's **Net Zero Strategy: Build Back Greener**[1] lays out an overarching strategy as to how the UK will reach its 2050 Net Zero target[2] and interim milestones of a 68% cut by 2030 and 78% by 2035.

To meet this target, in September 2023, the UK Government unveiled its **ZEV Mandate** requiring 80% of new cars and 70% of new vans sold in the UK to be zero emission by 2030, increasing to 100% by 2035. The current government has brought forward the target from 2035 to 2030.

The DfT's **Decarbonising Strategy (2021-2050)**[3] focuses on eliminating emissions across road, rail, maritime and aviation transport in the UK. It commits to 100% of the government's car and van fleet to be zero emission by 2027 and delivery of 4,000 new zero emission buses and the infrastructure needed to support the bus strategy.

The **DfT's Taking Charge: the electric vehicle infrastructure strategy**[4] focuses on developing a robust, fair and scalable charging network covering the entire country and expects to have at least 300,000 public charge points across the UK by 2030. It aims to develop rapid charging infrastructure across the strategic road network through the £950m Rapid Charging Fund and has also obligated local authorities to develop and implement local charging strategies including on-street charging.

According to the strategy, the UK Government's vision for 2030 requires that:

- Everyone can find and access a reliable public charge point.
- There shall be effortless on and off-street charging and a reliable network of high powered charge points along major roads.
- Public charge points shall be fairly priced and inclusively designed.
- The roll-out of the majority of charge points shall be market-led.
- Infrastructure shall be seamlessly integrated into a "smart" system.
- There shall be continued innovation to meet drivers' needs.

1 Net Zero Strategy: Build Back Greener
2 It means reducing carbon emissions by 100% compared to 1990's level.
3 Decarbonising Transport – A Better, Greener Britain
4 Taking charge: the electric vehicle infrastructure strategy

Regional

The **West of England Climate and Ecological Strategy and Action Plan 2023**[1] sets an ambitious target for the region to achieve net-zero emissions by 2030. Since transport is the region's largest contributor to greenhouse gas emissions, transitioning to EVs, alongside promoting walking, cycling, and public transport—is key to this goal.

The **WECA EV Action Plan** details the urgent need to reduce transport emissions to help the West of England achieve its ambitious target of Net Zero by 2030. Some of the key actions include:

- Encouraging a switch from petrol/diesel cars to EVs for trips that can't be replaced with walking, cycling or public transport.
- Ensuring access to high quality and inclusively designed public charging infrastructure.

The **WECA Adopted Joint Local Transport Plan 2020-2036**[2] envisages "connecting people and places for a vibrant, inclusive and carbon neutral West of England". It makes the following commitments:

- Provision of infrastructure to cater for technological advances in electric and autonomous vehicles will be prioritised.
- 5,000 EV registrations per year from 2020 in the West of England.
- Ensuring 100% of new homes (where applicable) have a charge point available.
- Formulate a strategy to overcome barriers to the provision of Ultra-low Emission Vehicle (ULEV) infrastructure
- Promote ULEV taxis through improvements to infrastructure, grants and other take-up incentives.
- Give greater consideration of low emission strategies within future planning documentation and define specific policy measures to encourage EV uptake, such as a West of England Electric Vehicle SPD and through Local Plan policies.

The **Western Gateway and Peninsula Electric Vehicle Charging Study**,[3] estimates that by 2035, 54,800 to 74,400 additional public charge points will be needed across the region. It suggests that 60% of these should be installed by the public sector, with the remainder on private land.

Local

The **Bristol One City Climate Strategy**[4] seeks to develop a plan for decarbonising the city through partnerships.

2030 goals:

- A carbon-neutral transport system, with more citizens walking, cycling and using low carbon public transport.
- 40% reduction in vehicle miles.
- All of Bristol's cars to primarily consist of ultra-low emission vehicles and 90% of other vehicles to be ULEVs.

Commitments:

- Installing and managing EV charging and hydrogen infrastructure.
- Reducing parking capacity and introducing a potential workplace levy.

The **Bristol Transport Strategy 2036**[5] aims to support sustainable growth by reducing carbon emissions and embracing new technologies. Its overarching transport vision for Bristol is "to be a well-connected city that enables people to move around efficiently with increased transport options that are accessible and inclusive to all". It commits to:

- Deliver & enable a Zero Emission Vehicle Strategy.
- Enable & explore measures to encourage the take up of low emission and appropriately sized freight vehicles.
- Explore opportunities to work with bus service operators to introduce low emission buses.
- Deliver appropriate levels of Electric Vehicle charge points.

Among other city priorities the **Bristol Corporate Strategy** 2025-2030 identifies an objective to make it easier, greener and safer to travel into and around Bristol. This includes support for decarbonising the transport network to become a carbon neutral city.

1 West of England Climate and Ecological Strategy and Action Plan 2023
2 WECA Joint Local Transport Plan 4 2020-2036
3 Electric Vehicle Charging Study
4 Bristol One-city Climate Strategy (2020)
5 Bristol Transport Strategy to 2036

2

Vision, Strategic Principles and Objectives

Vision

In consideration of Bristol's aim to become carbon neutral and tackle congestion and air pollution, the vision for the EVI Strategy is to:

'Facilitate a smooth transition to electric and low carbon forms of transport by investing in the development of a network of public electric vehicle charging infrastructure that is fairly distributed across the city, accessible, reliable, affordable and is well integrated with private infrastructure of residents and businesses. At the same time, acknowledge that the promotion of active, public and shared forms of transport remain the priority for alleviating congestion, reducing carbon emissions and improving health outcomes.'

Strategic Principles

A set of strategic principles has been identified which will underpin the achievement of the vision

The strategic principles include:

Accessible: The EVI roll-out should consider the needs of Disabled people, pedestrians and other road users with its deployment. As a Strategic Principle 'accessibility' should be understood in its widest sense. This means ensuring the design, location, usability, pricing structures, payment methods, reliability and availability of clear and accessible formats such as Easy Read.

It is important to reiterate that Disabled people are not a single group, and that different impairments and access needs require different design responses. Where feasible, embedding co-production with Disabled people throughout the implementation of the strategy will lead to better outcomes.

Meaningful engagement with Disabled people - and monitoring of accessibility outcomes - should be undertaken to ensure the design of the network meets 'real' rather than 'assumed' needs.

Fairly-priced: Tariffs for all publicly procured charge points should be set fairly and remain affordable to users. This can be acheived by ensuring a range of chargers of different speeds, and with varied pricing and payment options are available in the city.

Reliable: The EVI network should be reliable and operational 24/7. Any faulty charge points should be fixed or replaced within an acceptable time period, depending on the nature of the fault. Users should always be able to review their availability in advance (through Apps or website).

User-focussed and equitable: EVI must be fairly distributed across the city, focussing public funding on deprived and low demand areas. EVI roll-out should be prioritised in areas where residents do not have access to home charging.

Commercially viable: BCC will ensure the charge point network is developed in a way that does not create undue financial risks over the long term. BCC, along with BCL/ commercial partner, will actively seek private sector investment into development of EVI in the city. This will be informed by continuous monitoring of EV charging demand, and planning for EVI development ahead of demand.

Policy-led: The EVI network will be developed in consideration of other sustainable transport initiatives in the city. Even with a significant shift to EV's the council's evidence suggests that a 40% reduction in vehicle miles will be required to meet climate commitments. Therefore the roll out of EVI needs to consider the need for an overall reduction in vehicle use and car ownership. A like for like replacement of petrol/diesel vehicles for EV equivalents will not support the council in meeting wider transport, health and economic objectives. The Council will encourage alternatives to private car ownership by supporting the electrification of public transport, private hire, taxi and car club vehicles. New developments will be future proofed by adopting relevant planning policies and requirements. In addition, the Council will collaborate with regional partners and WECA for the delivery of a charge point network across the West of England alongside the promotion of better public and active transport.

Objectives

Five core objectives for the Strategy have been developed. They are presented below, along with a description of these objectives.

Objective 1: Deliver a high-quality, fairly distributed and accessible public charge point network.

A variety of EV charging solutions will be deployed in a way that balances the need for spatial equity, commercial viability, and serving deprived areas across Bristol, with installations likely to come forward in batches as demand grows and more funding becomes available. Appropriate charge point type e.g. slow, fast or rapid for the right type of location will be considered while planning the charge point roll-out.

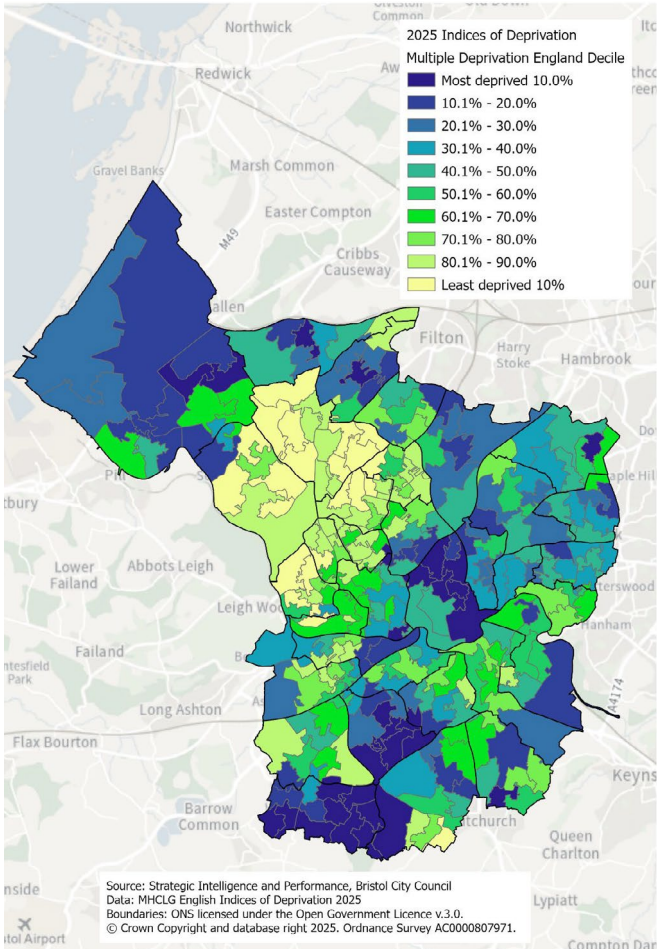
An analysis of underlying demand for EVI for both up to 22kW (Standard) and 50kW and over (Rapid) charging has been undertaken (See Chapter 4). This analysis shows areas in Bristol with relatively high demand for EV charging, and overlaying that with the existing charge point location data helps to identify the gaps in current charge point provision by charge point use cases. This analysis will inform future planning for the EV charging network.

Currently, Bristol has limited on-street charging options. In the short to medium term, funding from GRF and LEVI will be used to deploy over 1,000 on-street charge points in the city, with a focus on creating an accessible and fairly distributed network that supports the transition to EVs for all potential users, including in the most deprived areas in Bristol (See Figure 6.1). The needs of Disabled EV users, accessible charge point designs, and/or wider EV charging bays will be considered while deploying charge points.[1]

Available funding will be used to expand the public charge point network, and private sector investment will also be encouraged to support its growth. Public funding will be utilised to deploy or part-subsidise charge points in deprived areas, which are not always commercially viable.

BCC is also trialling cross-pavement charging in the city on a case-by-case basis, the findings from which will inform its future policies.

Figure 6.1: Bristol Indices of Multiple Deprivation (IMD)



1 The Council understands that on-street parking pressure exists in many neighbourhoods in Bristol and that non-EV users may be opposed to dedicated EV only parking bays and/or wider EV bays, especially in high demand areas (e.g. Controlled Parking Zones). The process of enforcing these parking bays will be tested during the delivery of GRF funded on-street EVI.

Objective 2: Deliver a consistent, reliable, and fair user EV charging experience.

BCC will play a key role in ensuring that the EVI network meets the needs of all EV users and does not create barriers to their use. BCC will ensure that guidelines for successful charge point deployment are followed through efficient management of EVI contracts. These guidelines include the UK Public Charge Point Regulations 2023,[1] set by the UK DfT (came into force in November 2024), which specify that:

- **Pricing transparency:** The maximum price of an EV charging session must be displayed clearly in pence per kilowatt hour.
- **Contactless:** New public charge points of 8kW and above and existing charge points of 50kW and above must offer a contactless payment option to consumers.
- **99% reliability:** Rapid charge points (50kW and over) must be reliable 99% of the time, measured over a calendar year.
- **Helpline:** A free to use 24/7 staffed telephone helpline must be available and advertised at all charge points.
- **Open data:** All charge point operators must make their data publicly accessible through Open Charge Point Interface (OCPI).

Other considerations include interoperability, roaming and payment system capability, smart charging, data security, and installation, operation, planning and procurement of charge points. Other EVI good practice guides are summarised in Appendix A.

Objective 3: Deliver a commercially sustainable charge point network that harnesses and reinvests private finance.

There are several commercial arrangements that can be agreed for development of the EV charging network, ranging from a fully Council owned and operated model (Revive) to a Council Concessioned or Leased model that is seen widely across the UK.

Suitable commercial models will be explored to ensure that EV charge points are convenient to use, reliable and accessible to potential users, and deployed in consideration of the needs of all road users.

Objective 4: Ensure the charge point network is future proofed, can meet demand and prioritises residents who do not have access to off-street parking.

BCC will ensure that the EVI deployed across the city remains fit for use in the long term. It will explore and trial (where feasible) a range of new technologies that offer users different options to charge their vehicles and enhance the overall user experience.

The Bristol Local Plan currently requires that one in five parking spaces in the city be equipped with active EV charging. This applies both to on-street and off-street parking. To future proof the streets and new developments in Bristol, an on-street EV Levy is being explored in the current review of the Local Plan.

It is important to note that there is a preference for siting lamp columns to the rear of footways to adhere to common standards, which may make provision of lamp column charge points unsuitable in the long term. The GRF project (with On-street Residential Charging Scheme (ORCS) match funding) will explore suitability of replacement lighting columns retrofitted with charge points.

BCC will prepare for future EV charging infrastructure roll-out by installing passive connections during any roadworks or redevelopment of Council-owned land and ensuring all new developments make passive provision as required under Building Regulations. It will also install charge points to support the electrification of its own fleet, depending on feasibility and available funding.

1 https://www.gov.uk/government/publications/the-public-charge-point-regulations-2023-guidance/public-charge-point-regulations-2023-guidance

Objective 5: Continue to invest in alternatives to private car use.

BCC will continue to promote sustainable travel through initiatives such as Liveable Neighbourhoods, walking and cycling improvements, bus priority measures and enhancements to rail and freight facilities. In addition, BCC will support the electrification of shared transport vehicles in the city including taxis, ride-hailing vehicles (e.g. Uber) and car clubs.

Going forward, BCC will play an enabling role in supporting the transition of shared transport vehicles to fully electric.

The vision, the strategic principles and the objectives for the Bristol EVI Strategy align with policy commitments and funding programs available at the national, regional and local levels. This includes the UK Government's overarching vision for 2030 that states that *'everyone should have access to reliable EV charge points through inclusively designed public charging and effortless on and off-street charging solutions.'*[1]

1 Taking charge: the electric vehicle infrastructure strategy, UK Department for Transport, March 2022

3
EV Charging Landscape

Electric Vehicle charging Infrastructure (EVI)

Types of EV Charging

There are different types of EV charging options, including those for both domestic and public use. Residents with off-street parking, such as driveways, will mostly charge at home using domestic power and charging schemes exist which allow residents to share their chargers with other EV drivers (e.g. Co-Charger, JustCharge). Many residents without off-street parking will rely on public charge points, including kerb side and public parking-based slow and fast charge points. They can be convenient and more cost-effective when used overnight on an off-peak tariff.

Rapid and ultra rapid charge points are the most expensive to use in terms of costs per kW charging but are useful for EV users who drive high daily mileages, such as taxi and other commercial vehicle drivers, and for those who are in need of a quick top-up or en-route charge.

Even with the quickest chargers, recharging an EV currently takes longer than refuelling a petrol or diesel vehicle. However, due to the widespread availability of the electricity network, EVs can be charged at many different locations. Table 3.1 shows a comprehensive overview of the options available to EV drivers, describing where and how they can recharge their vehicles and how long it takes to charge a vehicle.

Figure 3.1 presents the different types of connectors used by EVs in the UK.

Figure 3.1: Connector types, left to right, CHAdeMO, CCS, and Type 2.

Source: www.zap-map.com

Table 3.1: Types of public EVI by charging speed, power, usage location type, and charging time from 0-100% charge except rapid and ultra-rapid which is *0 – 80% charge.

Charge point type	Charge point power	Usage location type	Charging time	
			40 kWh battery Nissan Leaf/ Renault Zoe	90 kWh battery Jaguar I-PACE
Slow (e.g. Wall, Lamp column, Bollard)	3.6 kW	Home/ Depot; Offices or Commercial Buildings; On-street.	14 hours	30 hours
Fast (e.g. Bollard, Standalone, Flat and Flush)	7-22 kW	On-street; Car Parks; Destination.	6 hours	13 hours
Rapid (e.g. Standalone)	50-100 kW	On-street; Destination; En-route; Motorways.	25-40 minutes*	60-90 minutes*
Ultra-rapid (e.g. Standalone)	150+ kW	Destination; En-route; Motorways.	Vehicle cannot charge at this speed	20-45 minutes*

Source: www.zap-map.com

A summary of emerging innovations in EV charging solutions are included in Appendix B.

Cross-pavement Charging

Cross-pavement charging is an innovative EV charging solution that allows households/car owners with access to on-street parking outside their homes to safely pass a cable from their property to the car to charge their vehicle. Cross-pavement charging typically draws power from the household's domestic energy supply and does not require new connections to the electricity grid. This solution is attractive to users as they can charge their vehicles at domestic electricity rates which are typically cheaper than on-street public charge point rates.

A cable channel is typically embedded within the pavements, allowing households to safely pass the cables from their homes through the pavement to the street to charge an EV parked outside their home. The cable is then removed when the car is not charging. The channels are levelled with the pavement and therefore are unlikely to cause a trip hazard for the other pavement users, both when in use and when not in use.

A high-level assessment of Bristol's streetscape and housing density estimates that up to 28,700 households in Bristol living in terraced houses can potentially use cross-pavement channels to pass a cable from their home EV charge point to an EV parked outside their home. This represents about:

- 15% of all households in Bristol, or
- 30% of households who do not have access to off-street parking living in terraced houses or other properties, or
- about half (47%) of households living in terraced houses only.

ODS Gul-e, Oxfordshire (top) and Kerbo Charge Channel, Shropshire (bottom). Source: DfT

Cross-pavement Charging Trial in Bristol

A cross-pavement charging trial in Bristol has been approved by the Transport and Connectivity Committee, where permission to install will be considered on a case-by-case basis. The trial is expected to commence in 2026. Currently residents need to obtain planning permissions from the local highway authority and/or local planning authority, prior to installation. The application should include relevant plans, forms and payment of an application fee.

BCC will then assess the application for its impact on traffic, pedestrian safety, accessibility and the surrounding environment. Before giving permission to install cross-pavement channels, BCC will ensure that the resident has installed or committed to install a compliant home charge point, meeting BS-7671 standards.

A summary of other emerging innovations in EV charging solutions are included in Appendix B.

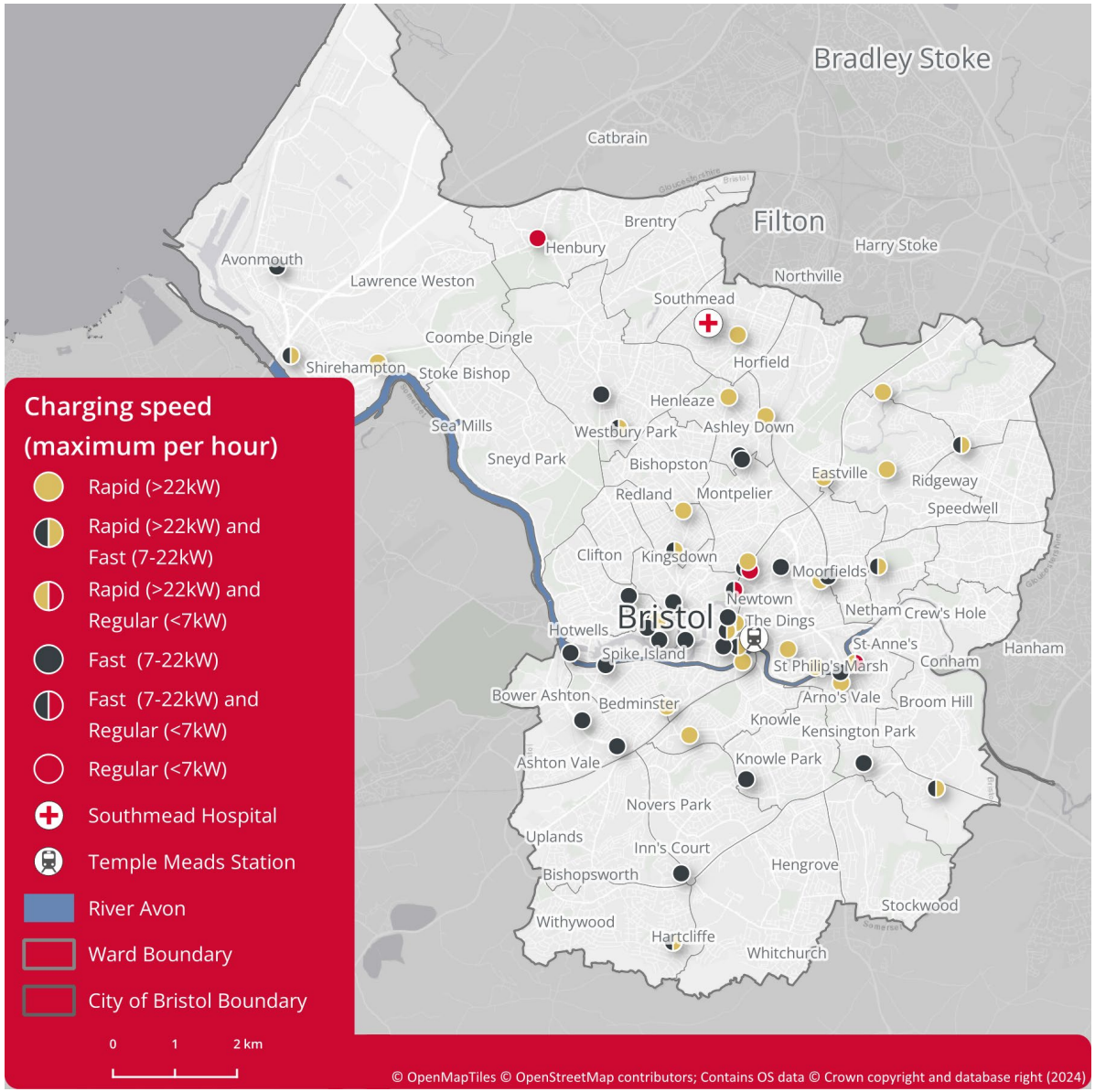
EVI in Bristol

There are a range of different types of publicly accessible charge points available across Bristol. As of April 2025, there were approximately 50 rapid charge points (50 kW and above) and around 150 standard charge points (up to 22 kW) across Bristol for public charging. Residents can use zapmap.com to find the latest information on all the EV charge points available in Bristol (and across the UK). About 75% of the current network is privately owned and operated.

Revive is a network of public EV charge points in the West of England. Revive has been designed to be a reliable, easy to access network that is expected to grow with rollout supported by public subsidies.[1] The Revive network has been created by the local authorities of Bristol, South Gloucestershire, Bath and North East Somerset, and North Somerset and includes around 120 charge points across the network. Bristol currently has 32 fast and 13 rapid charge points in the Revive network.

Figure 3.2 shows the locations of existing publicly accessible charge points in Bristol. A high proportion of these charge points are available in and around the city centre, and Temple Meads.

Figure 3.2: Bristol public EV charging locations



Source: Based on Zapmap data, and WECA Revive network locations (2024)

1 Revive charging network - WEST (travelwest.info)

The Opportunity in Bristol

The £7 million **Go-Ultra Low West (GULW)**[1] project was a partnership between the local authorities of Bristol, South Gloucestershire, North Somerset and Bath & North East Somerset. It aimed to encourage EV adoption through the delivery of a public EV charging network between 2019 and 2021. More than 120 charge points have been installed through the project as part of the 'Revive' network (previously known as the Source West Network), which is publicly owned and operated. This includes a combination of 7-22kW fast and 50kW rapid charge points strategically located in car parks and other council land.

There are currently a very limited number of residential charge points available in Bristol. WECA's **Green Recovery Fund (GRF)**[2] committed £4.9 million, out of which £2.16 million has been allocated to Bristol, to develop and expand the Revive network by March 2027. This expansion will focus on meeting the demand for residential charging, particularly in areas like Bristol's dense Victorian suburbs, where many residents don't have access to off-street parking. This project will allow BCC to test the delivery of on-street EVI, alongside understanding the need to update the city's on-street parking regulations to accommodate on-street charge points. The residents currently have the facility to request charge points near their place of residence or work through the TravelWest website.

In addition, the DfT's **Local Electric Vehicle Infrastructure (LEVI)**[3] fund, which has been allocated to Bristol through WECA (pending approval), aims to attract significant private investment into low powered (up to 22kW) charging to support local demand in the short term (by 2030). The fund will support the provision of charge points in lower density and more deprived areas within the region, and private investment will be encouraged for relatively high demand areas. The fund also includes capability funding for local authorities to develop dedicated staff to plan, deliver and manage the EVI network in the area.

Local High Streets are important for local trips and serve as destination points where people park their vehicles for short periods. Additionally, high demand for charging is expected on Bristol's multiple transport corridors which carry high volumes of traffic. These areas will be prioritised for rapid and ultra-rapid (up to 350kW) charging hubs, when feasible. Most of these charging stations will be delivered through private investment. Bristol's port facilities, First Bus depots, and convergence of the M5 and M4 motorways offer additional opportunity for serving commercial vehicle charging needs through the rapid charging hubs.

Other funding options available for EVI development are included in Appendix C.

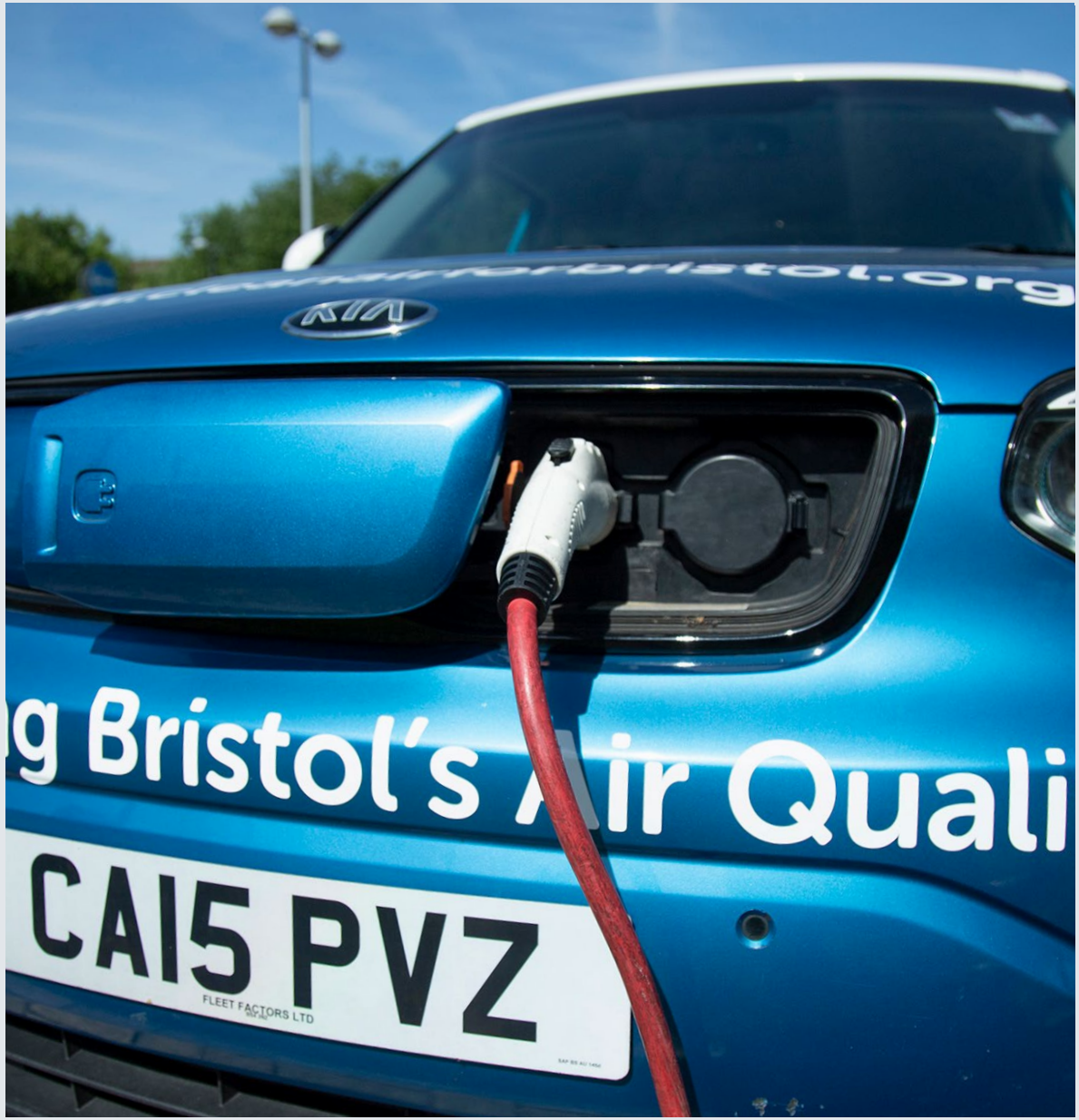
Through GRF and LEVI projects, an expected 750 slow (3-5kW), 250 fast (7-22kW) and 15 rapid (50-100kW) charge points will be deployed in Bristol by 2030.

1 Go Ultra Low West - WEST (travelwest.info)
2 Green Recovery Fund - West of England Combined Authority (westofengland-ca.gov.uk)
3 Apply for Local Electric Vehicle Infrastructure (LEVI) funding - GOV.UK (www.gov.uk)

Bristol City Leap (BCL) is an innovative 20-year partnership between Bristol City Council (BCC), Ameresco UK and Vattenfall Heat UK launched in 2023 which was set up to enable the delivery of over £1 billion of investment into Bristol's energy system, supporting decarbonisation of the city, including transport. Through the partnership, Ameresco can support BCC with a number of roles where these are required:

- **Innovation –** testing the market for new products and services in the supply, delivery, operation and management of EVI.
- **Site qualification –** within the defined scope of an investable project, Ameresco will support BCC with surveys, designs and satisfying regulatory compliance. This can include an analysis of end-user requirements and grid supply capacity.
- **Delivery –** provide end to end project design and delivery, including all aspects of project management, contracting, and compliance requirements for the supply and installation of charge points and ancillary works.
- **Performance –** enter contracts as required for the operation and management of assets and back-office functions.
- **Consultation –** supporting BCC as required with strategic insight and advice to support decision-making, from multi-year experience on BCC's EVI projects.

BCL can support BCC in managing their EVI contracts and will lead the deployment of future EVI across the city. This partnership offers BCC a unique advantage in expanding its EVI network quickly and efficiently.



4

EVI Scenarios and Forecasts

Estimated EV Adoption in Bristol

The number of registered EVs in Bristol has grown steadily in recent years due to increasing consumer confidence and availability of relatively cheaper EV models, supported by an increase in public EVI. Despite this, in 2023, there were only approximately 4,900 registered EVs (including cars and vans) in Bristol, comprising 2% of the total registered vehicles in the city.

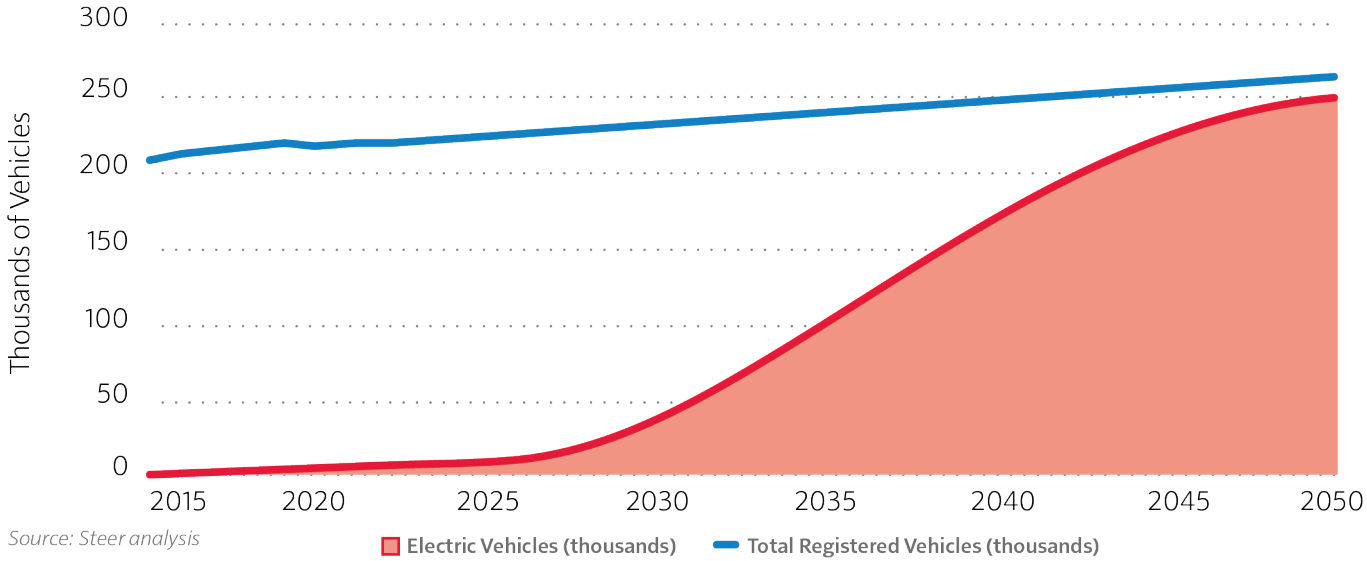
Growth in EV adoption throughout the UK in the next decade will be guided by the UK Government's ZEV mandate[1] which has set ambitious EV sales targets for vehicle manufacturers (see Table 1.1 in Chapter 1). The forecast for EV adoption in Bristol is based on an annual "rolling forward" of the total registered vehicles in the city considering:

- Annual percentage EV share in new car and van registrations as per the ZEV mandate (adjusted to local conditions); and
- The average useful life of the registered cars and vans after which the vehicles are replaced (typically 15-17 years).

It is expected that there will be about 15,000 EVs in Bristol in 2027, 40,000 in 2030 and 120,000 by 2036 accounting for over 50% of total registered vehicles. By 2050, over 99% registered vehicles in Bristol are expected to be EVs.

Figure 4.1 presents the forecast EV adoption curve for Bristol up to 2050.

Figure 4.1: Forecast EV adoption and share in total registered vehicles in Bristol



Source: Steer analysis

1 Consultation on a zero emission vehicle (ZEV) mandate and CO2 emissions regulation for new cars and vans in the UK, March 2023, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1154610/zev-mandate-co2-emissions-regulation-consultation-document.pdf

Scenarios for EVI Development in Bristol

The demand for public EV charging depends on how EV users choose to charge their vehicles and will differ based on their preference for charging, as well as access to different types of EV charge points, such as at home chargers, or through public fast/rapid/ultra-rapid charge points.

The DfT's study **Taking Charge: The Electric Vehicle Infrastructure Strategy** states that ***'The vast majority of drivers will do most of their charging at home, overnight. We need public charge points for two main purposes: to enable long distance journeys, and to support those without off-street parking'.***[1]

To address uncertainty about users' charging preferences, three scenarios were developed to estimate future EVI demand[2]:

- **Balanced (most likely) Scenario:** Car owners with off-street parking will charge 80% at home, with 20% using rapid/ultra-rapid chargers. Car owners without off-street parking will charge 80% on-street using standard/fast chargers, with 20% on-route using rapid/ultra chargers. Vans will rely 80% on rapid/ultra chargers and 20% on depot/home charging.
- **On-Street Preferred Scenario:** Both car and van users primarily charge on-street using standard/fast chargers (80%), with 20% of both charging en-route using rapid/ultra chargers.
- **Rapid Preferred Scenario:** Both car and van users prefer rapid/ultra chargers for 80% of their charging, with 20% using standard/fast chargers on-street.

All scenarios assume that vehicles with private parking charge mainly at home or at a depot. These forecasts will help guide future EVI network development in Bristol. Given the evolving nature of the EVI market and the planned cross-pavement charging trial in 2026 which may impact demand for public charge points, the scenarios will be closely monitored and revised based on new evidence. Please see Appendix D for the different scenario explanations.

1 Taking charge: the electric vehicle infrastructure strategy (publishing.service.gov.uk)

2 Other forecasting methods such as Cenex's NEVIS platform are also available

EVI Forecasts

The supply of public EVI in Bristol will be driven by:

- Funding from the GRF and LEVI; and
- Increasing commercial viability of investment in charging infrastructure arising from growth in EV uptake.

The study forecasts, in the Balanced (most likely) scenario, about 800 charge points will be needed in Bristol to meet the demand for charging from increased EV adoption by 2027. That will be an additional 600 charge points to the existing 200 charge points. By 2036, it is forecast that over 5,300 charge points will be needed to meet the charging demand of over 120,000 EVs that are expected to be registered in Bristol.

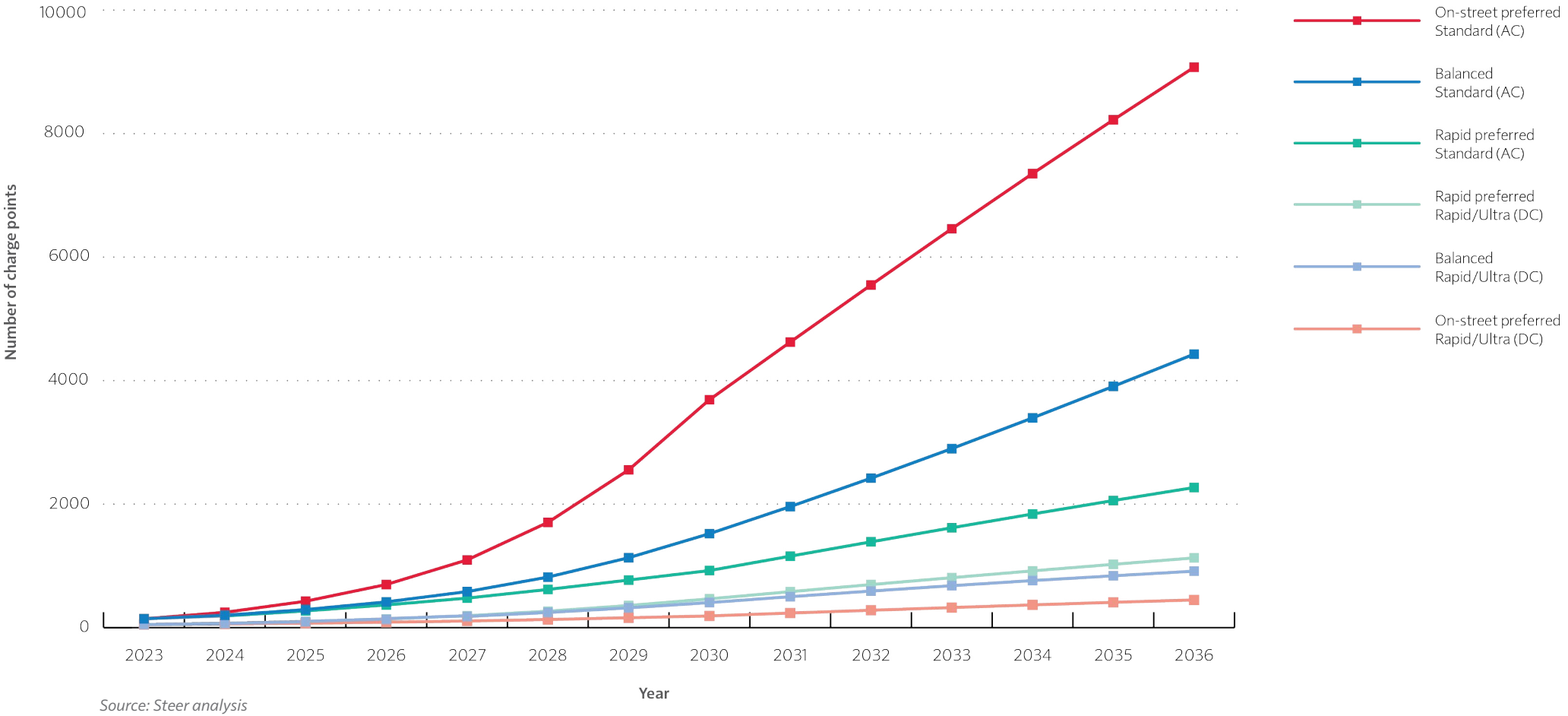
Table 4.1 presents the total number of public charge points available in Bristol (April 2024) and the annual forecast for public EVI by type and scenario for years 2027, 2030, 2033, and 2036, followed by Figure 4.2 showing forecast EVI growth from 2023 to 2036. Not all of these charge points will be on council land, some of them will also be delivered on private land such as supermarkets, shopping centres, and workplaces that are accessible to the public.

Table 4.1: Summary of EVI forecast for Bristol by different scenarios for select years

Scenarios	Type of EVI	2024*	2027	2030	2036
Balanced	Standard (AC)	150	583	1,521	4,420
	Rapid/Ultra (DC)	50	181	405	914
On-street preferred	Standard (AC)	150	1,096	3,691	9,075
	Rapid/Ultra (DC)	50	107	189	448
Rapid preferred	Standard (AC)	150	478	924	2,269
	Rapid/Ultra (DC)	50	193	466	1,129

**Based on ZapMap data on all publicly available charge points in both council and private land such as supermarkets*
Source: Steer analysis

Figure 4.2: Forecast EVI growth for Bristol by different scenarios (2023-2036)



Source: Steer analysis

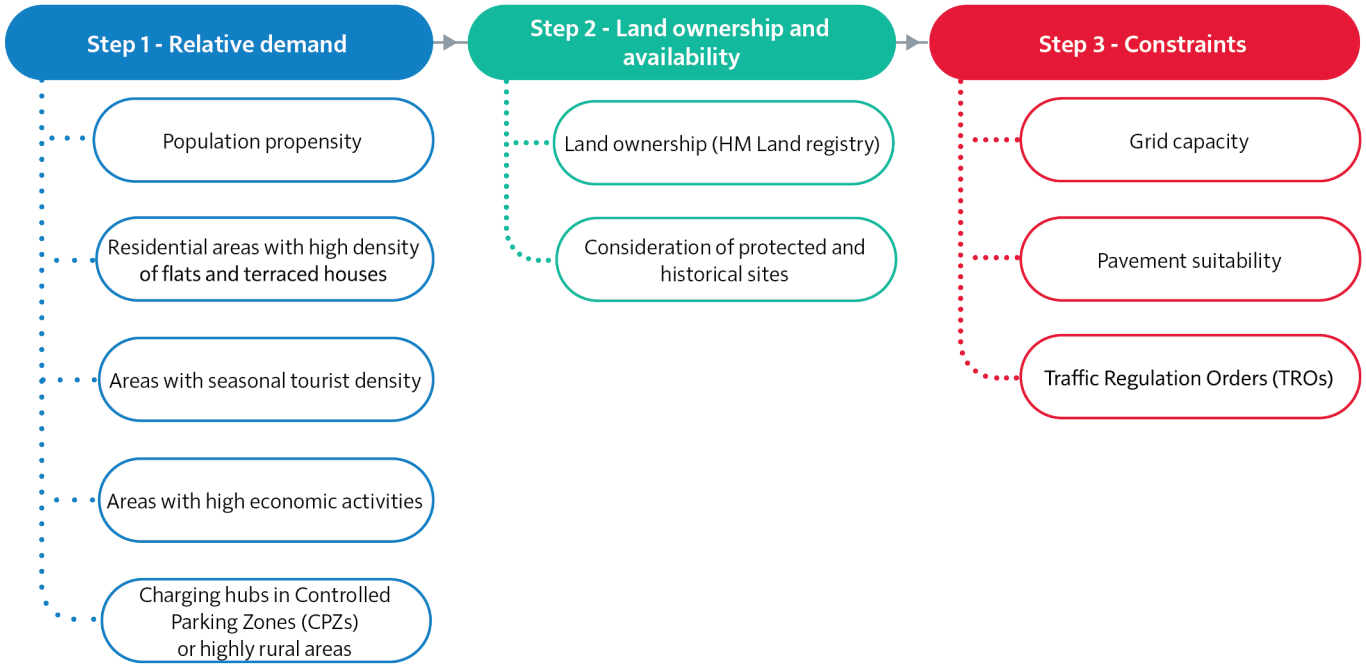
5
EVI Location Assessment

Planning EVI Deployment Locations

The study **Getting to the point**[1], published in 2023 by the Geospatial Commission, stated that identification of locations for EVI deployment should consider various factors in three steps, as presented in Figure 5.1. They include:

- Relative demand for charge points;
- Land ownership and availability of suitable locations; and
- Other site constraints such as electrical capacity.

Figure 5.1: EVI location assessment and site selection method



Source: Adapted based on recommendations of Geospatial Commission Study on Accelerating EV Chargepoint rollout

1 Getting to the point: Accelerating EV charge point rollout through geospatial data, Geospatial Commission, 2022

Relative Demand Mapping

An analysis of population, car ownership, traffic flow and other socio-economic factors across Bristol was undertaken to evaluate the demand for two types of public charging options, namely:

- Residential charging (typically up to 22kW); and
- Top-up charging (typically 50kW and above).

Residential Charging (<22kW) Relative Demand

Residential charging demand is from households who do not have access to private, off-street parking. For these residents who must park on-street, the most convenient charging option is to use standard or fast chargers on-street near where they park.

The residential relative demand map (see Figure 5.2) considers which areas in Bristol have relatively higher demand based on household characteristics. The two key factors influencing this demand are population density and the availability of off-street parking, which often depends on the type of housing in the area.

Table 5.1 outlines the criteria used to develop a hexcell[1] map showcasing the distribution of public EV charging demand across Bristol, for up to 22kW EV charge points (standard/fast) by residents with EVs.

Table 5.1: Indicators used for relative residential charging demand analysis

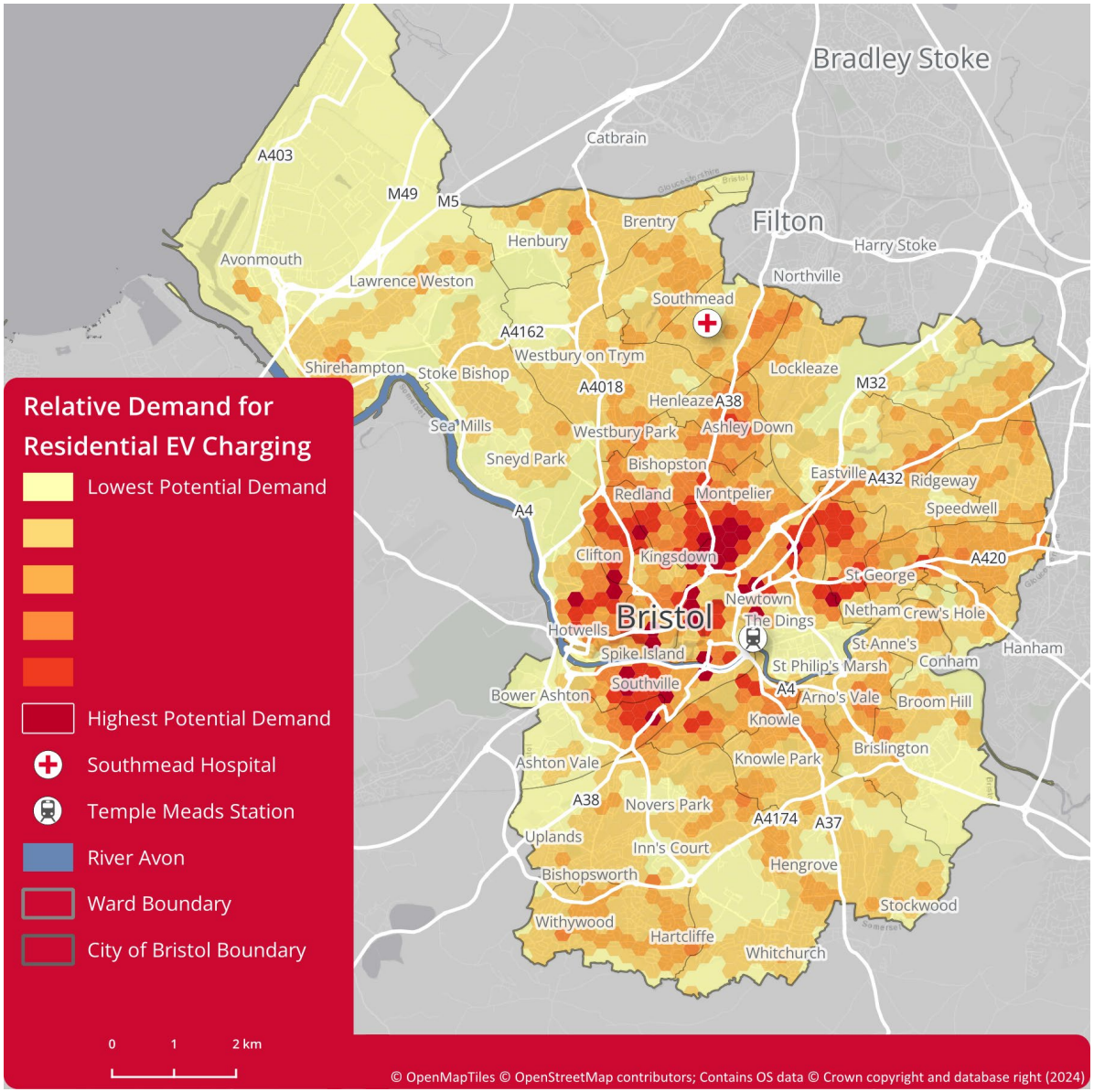
Dataset/variable	Source	Justification for consideration	Importance in analysis
Population	England and Wales Census 2021	Population is a key driver of any potential demand. More population will mean more demand	High
Housing type	England and Wales Census 2021	Locations with a higher on-street parking requirement are rated higher. This is modelled via housing type – Detached and Semi-detached are less likely to require on street chargers.	High
Car Availability	England and Wales Census 2021	Higher proportion of car owning households will have higher demand.	Medium
Population Favourability for EVs	Experian Mosaic	The higher the population showing favourability toward EVs the higher uptake of EVs amongst those households, and therefore demand for EV charging.	Medium
Income	Experian Mosaic	A location with households with higher disposable income is rated slightly higher as they are more likely to own an EV (which are relatively more expensive to purchase compared to a diesel/petrol car)	Medium

1 The entire city is divided into hexcells, each of which is 300 metre wide which is roughly a 3 minute walk.

The relative demand for residential charging is highest in the central areas of the city, particularly around Temple Meads, Redcliffe, and Clifton, as well as neighbourhoods such as Montpelier, St. Paul's, and Bedminster. The demand remains high north of the River Avon, extending through areas like St. Andrew's, Bishopston, and Horfield, while moderate demand is observed in areas such as Westbury-on-Trym, Henleaze, and Fishponds.

Figure 5.2 presents the relative residential charging demand map for Bristol, with the darkest red/brown areas having highest potential and the lightest yellow having the lowest.

Figure 5.2: Bristol relative demand for residential EV charging (typically up to 22kW)



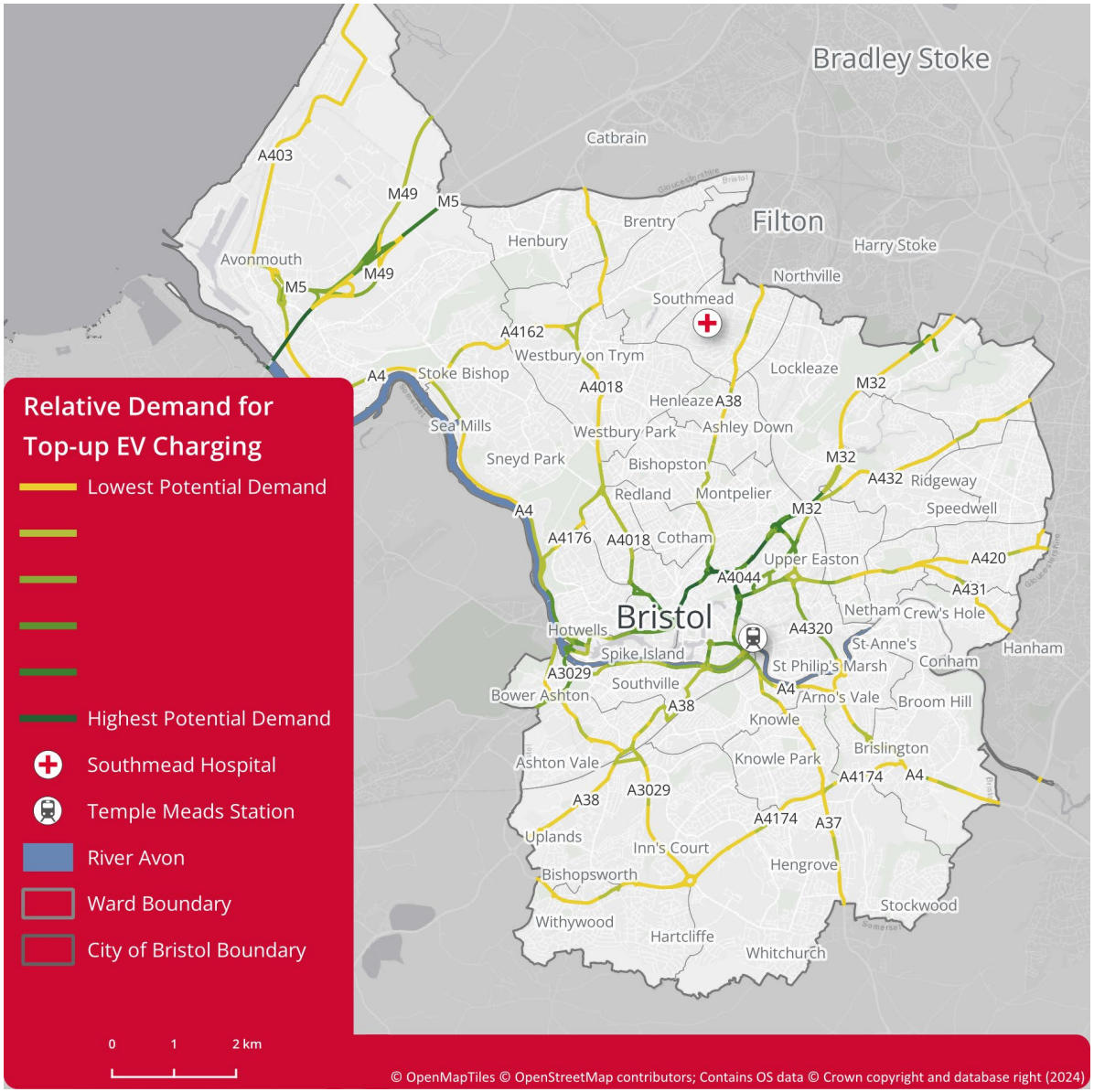
Source: Steer analysis

Top-up Charging (50kW and over) Relative Demand

Rapid charge points charge cars more quickly (about 0% to 80% charge in 30 mins) and therefore serve a higher turnover of drivers than standard or fast chargers. Rapid charge points are best placed along the busiest routes where there is high demand from passing traffic. The analysis underlying the map in Figure 5.3 scores major roads in Bristol based on DfT annual average daily traffic flow data and the proximity to key destinations/ 'Points of Interest' within a short distance of each road. BCC will facilitate development of rapid charge points along the strategic road network, particularly in high potential areas, based on site suitability and ownership.

The highest potential for top-up charging is concentrated around Bristol Temple Gate, a major transport hub connecting the city centre. Demand extends along the A4032 (M32) towards Eastville Park due to its heavy commuter traffic and nearby residential areas. There is also significant potential in the Avonmouth area, particularly near the M5 and M49, as these are key routes for logistics and commercial traffic. High demand corridors also include the A38, running north-south through areas like Bedminster and Horfield, and the A4, connecting the city centre with Bath and Bristol Airport. Other notable areas include Clifton and Montpelier, where demand is driven by dense residential zones, and main roads like the A432 towards Fishponds and the A370 towards Long Ashton, which see consistent commuter and local traffic.

Figure 5.3: Bristol relative demand for top-up EV charging (50kW and over)



Source: Steer analysis

Road Network Suitability for On-street EVI in Bristol

It is easier to deploy on-street EV charge points on certain types of roads, such as residential streets compared to A roads or dual carriageways. We have undertaken a high-level analysis of the suitability of different roads across Bristol for on-street EVI deployment. This analysis considers the type of road and speed limits on different roads, alongside other key indicators that impact suitability for on-street EVI deployment, typically up to 22kW (or rather identify roads/streets that are unsuitable for EV charge point deployment).

The key variables considered for the road suitability analysis are presented in Table 5.2.

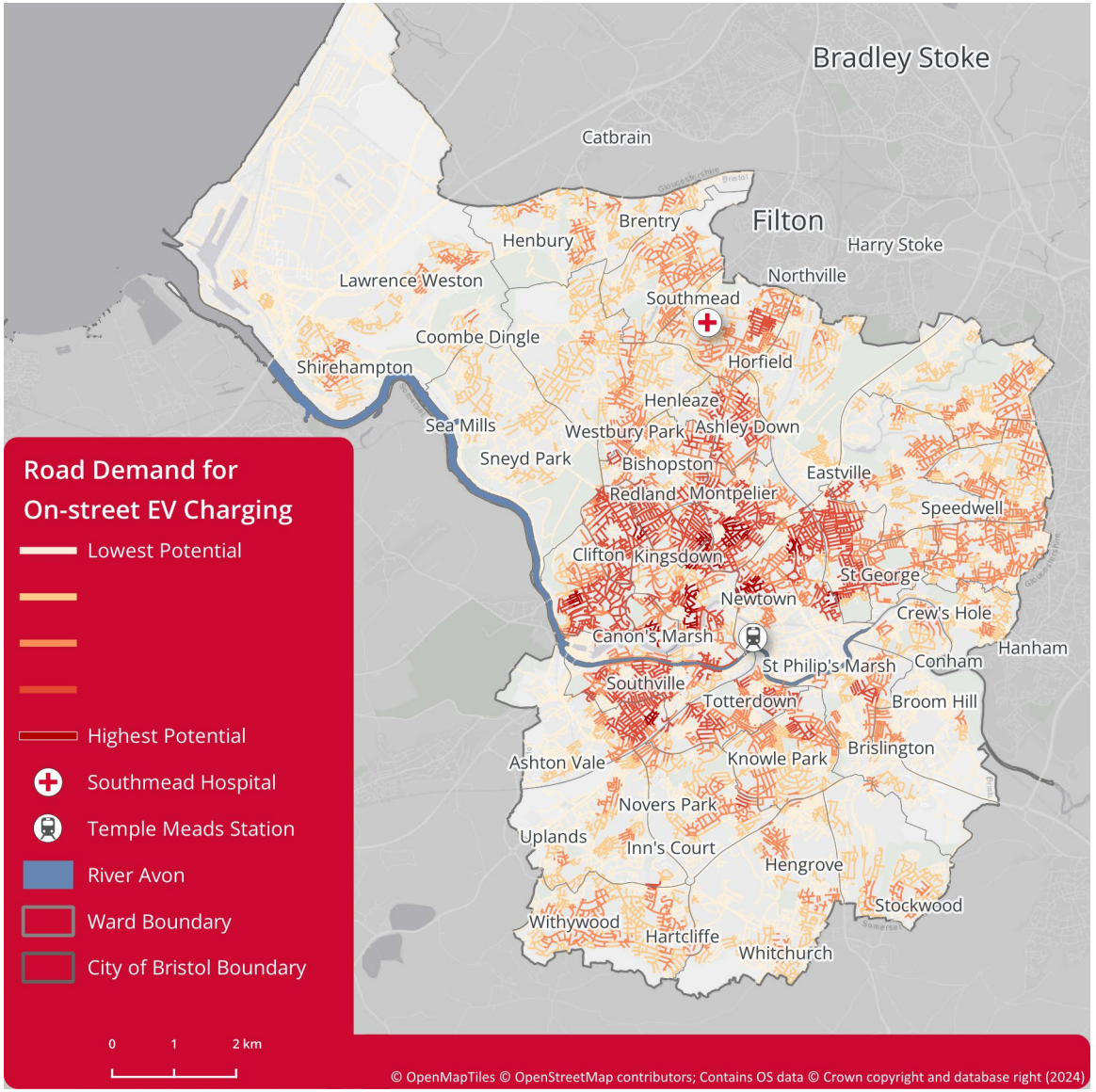
The underlying demand for residential charging (as identified in Figure 5.2) when considered alongside road suitability for on-street EVI deployment, helps to identify roads across Bristol which have both the highest potential demand and are most suitable (easier) for EVI deployment.

Table 5.2: Indicators used for road suitability analysis for on-street EVI

Dataset/ variable	Source	Justification	Importance
Street function	OS Open Roads	Specific road function will be more appropriate than others for on-street charge point deployment, for example, Dual Carriageways and Motorways are assigned a lower score compared to residential streets.	High
Street speed	Local Authority	Certain road speeds will be more appropriate than others for charge point deployment. Lower road speed has been assigned a higher score (20mph and 30 mph considered based upon the dataset analysed).	High
Pavement area	Local Authority	More pavement in an area means there is more opportunity for a charge point to be installed without affecting pedestrian movements. However, BCC's preference for deploying charge points is build-outs on carriageways over pavement.	Medium
Residents' Parking Scheme (RPS) area	Local Authority	It is often easier to implement charge points in areas with controlled parking, where only resident permit holders are allowed to park, hence these areas are assigned a higher score.	Medium
Conservation sites	Local Authority	Installation of charge points will be more difficult in locations close to protected or heritage buildings or sites due to planning rules, hence these sites are assigned a lower score.	Low

Figure 5.4. presents the combined map of underlying demand and road suitability for on-street EV charge point deployment across Bristol. The residential charge point deployment going forward could be guided by the analysis. The darkest (red) roads have both higher relative demand and are relatively more suitable for EVI deployment. These areas, as shown on the map, are to the north of the Harbourside, particularly in Clifton East and to the west of Cheltenham Road.

Figure 5.4: Bristol underlying demand and road suitability for on-street EV charging



Source: Steer analysis

6
Action Plan and Monitoring

EVI Action Plan

Table 6.1 presents a summary of the key actions required to deliver more EVI in Bristol, along with the delivery timeframe, who will be responsible for delivery, and the costs to deliver them. They are based on the analysis that has been undertaken and summarised in Chapter 4 and Chapter 5 which provides an analysis of the scale of charge points required, where it would be suitable to deploy based on underlying demand and where it is feasible.
Key actions also reflect guidance around good practices in EVI development, as summarised in Appendix A.

Table 6.1: EVI action plan

Objectives	Actions		Timeframe	BCC's Cost to Deliver	Delivery department
Objective 1: Deliver a high-quality, fairly distributed and accessible public charge point network.	**a**	Work with BCC Highways teams to deploy 150x lamppost-integrated charge points utilising the GRF, prioritising residential areas without access to off-street parking.	To 2027	£	BCL/Commercial Partner and BCC
	b	Utilise the LEVI fund to significantly increase charge point availability in residential areas, working with BCC to ensure there is coverage in areas of deprivation.	To 2030	£	BCL/Commercial Partner and BCC
	c	Deliver charge points across BCC car parks and ensure they are well lit and accessible to all users.	To 2030	£££	BCL/Commercial Partner and BCC
	d	Attract private sector funded deployment of rapid EV charge points across the city, focussing on key transport corridors and the areas identified in Figure 5.3.	To 2030	£	BCL/Commercial Partner and BCC
	e	Actively seek further public funding where required to fill gaps in the EVI network.	Ongoing	£££	BCL/Commercial Partner and BCC
	f	Support installation of EV charge points for businesses by providing advice and clear information e.g. planning considerations, funding opportunities.	Ongoing	£	BCL/Commercial Partner and BCC
	g	Ensure that equalities groups and key stakeholders (e.g. Motability Foundation) are proactively consulted to improve accessibility of charge points.	Ongoing	£	Bristol City Council
	h	Wherever possible, ensure that new EVI meets the recommended standards for accessibility set out in PAS 1899:2022, dependant on location and space availability.	Ongoing	£	BCL/Commercial Partner and BCC

Reference for costs to deliver: £ - <£10,000, ££ - £10,000-£50,000, £££ - >£50,000

Objectives	Actions		Timeframe	BCC's Cost to Deliver	Delivery department
Objective 2: Deliver a consistent, reliable, and fair user charging experience.	**a**	Ensure contactless payments are available on all new charge points offering 8kW or more, for ease of use, in line with the UK Public Charge Point Regulations 2023.	Ongoing	£	BCL/Commercial Partner and BCC
	b	Ensure a fair price for charging for assets delivered through LEVI via a margin cap or similar mechanism.	Ongoing	£	Bristol City Council
	c	Ensure that all charge points on public land are operated in line with the UK Public Charge Point Regulations 2023, including standards for reliability, and that performance tracks future changes to legislation.	Ongoing	£	BCL/Commercial Partner and BCC
	d	Ensure all EV charging locations can be found online and allows users to view their capacity, availability and charging costs.	Ongoing	£	BCL/Commercial Partner and BCC
	e	Enable the deployment and enforcement of EV only bays where required, to ensure EV users are able to park and charge their vehicles when they need them.	Ongoing	£	Bristol City Council
	f	Provide clear information and advice for members of the public, businesses and visitor destinations to support the switch to electric.	Ongoing	£	BCL/Commercial Partner and BCC
Objective 3: Deliver a commercially sustainable network that harnesses and reinvests private finance.	**a**	Work with WECA to ensure BCC's charge point delivery plans are aligned with regional strategies, increasing regional benefits of investment.	Ongoing	£	Bristol City Council
	b	Ensure the LEVI contract provides Value for Money, is structured to protect BCC from financial risks and reinvests private finance into the charging network.	To 2027	£	BCL/Commercial Partner and BCC

Reference for costs to deliver: £ - <£10,000, ££ - £10,000-£50,000, £££ - >£50,000

Objectives	Actions		Timeframe	BCC's Cost to Deliver	Delivery department
Objective 4: Ensure the charge point network is future proofed and can meet demand.	**a**	Ensure new charge points on council land are compatible to charge all EVs on the road, and are accessible to charge in as many ways as possible.	Ongoing	£	BCL/Commercial Partner and BCC
	b	Follow DfT's latest guidance on licences, permits and traffic regulation orders for installation of on-street charge points.	Ongoing	£	BCC
	c	Require new housing developments whose residents require on-street parking, to pay an EV charge point Levy, to better match charge point installations with demand via area-based site selection.	To 2027	£	BCC
	d	Monitor innovative EV charging solutions that are being trialled across the UK and consider roll out across Bristol (subject to feasibility).	To 2027	££	BCL/Commercial Partner and BCC
	e	Maintain close contact with the electricity distribution network operator to ensure grid capacity is future-proofed and avoid unnecessary delays in delivery.	Ongoing	£	BCL/Commercial Partner and BCC
Objective 5: Continue to invest in alternatives to private car use.	**a**	Support electrification of car clubs in the city by deploying dedicated charge points for electric car club vehicles at strategic locations.	Ongoing	££	Bristol City Council
	b	Work with stakeholders and taxi/private hire operators, as part of EVI project delivery, to understand and identify locations for where charge points could be installed to facilitate convenient usage by drivers.	Ongoing	£	BCL/Commercial Partner and BCC
	c	Enable taxi and private hire vehicles operating in the city to be zero emission by ensuring that availability of high-power charge points is not a barrier to electrification.	To 2030	££	BCL/Commercial Partner and BCC

Reference for costs to deliver: £ - <£10,000, ££ - £10,000-£50,000, £££ - >£50,000

Monitoring and Evaluation

The Public Charge Point Regulations 2023 guidance[1] recommends all charge point operators (CPOs) to share data on charge point locations, availability, and tariffs as a minimum through open sources. In addition, the procurement of new charge points in Bristol by the public sector should ensure relevant data on availability, usage by time of day and frequency and any updates are collected and shared periodically. This data will be reviewed by BCC's delivery partner to plan for further EV charging infrastructure development.

BCC, along with a delivery partner, will monitor progress and delivery of the objectives of the Strategy, that will include:

- Quarterly/Annual review of EV adoption in Bristol using GOV.UK data on vehicle statistics
- Quarterly/Annual review of growth in EVI provision using ZapMap data and data reported by BCL/commercial partner on charge point availability and usage
- Development of a Yearly Performance Report reviewing progress on delivery of the actions in this Strategy against the agreed timescales

In addition, the Yearly Performance Report will assign clear 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 of the action on the objectives.

Some actions that are ongoing will be checked for relevance and applicability during yearly reviews. This will include sharing information and knowledge with other stakeholders and the public and implementing lessons learnt.

1 Public Charge Point Regulations 2023 guidance - GOV.UK

Appendices

A Policy and Good Practice Review

Table A.1 presents a list of relevant documents and guidance reviewed to inform this Strategy.

Table A.1: National, Regional, Local Policies & Good practice Guidance

National policies	
Decarbonising Transport – A Better, Greener Britain, UK Department for Transport, July 2021 (updated January 2023)	Taking charge: the electric vehicle infrastructure strategy, UK Department for Transport, March 2022
Net Zero Strategy: Build Back Greener, UK Department for Energy Security and Net Zero and Department for Business, Energy & Industrial Strategy, October 2021 (updated April 2022)	
Regional policies	
WECA Joint Local Transport Plan 4 2020-2036, March 2020	Electric Vehicle Charging Study, Peninsula Transport and Western Gateway, February 2024
	West of England Climate and Ecological Strategy and Action Plan 2023
Local policies	
Climate Emergency Action Plan, Bristol City Council (2022), Bristol City Council	Bristol One-city Climate Strategy (2020), Bristol City Council
Good practice guidance	
Public Charge Point Regulations 2023 Guidance, UK Department for Transport, March 2023	Charging Infrastructure, Green Finance Institute, 2022
Procuring electric vehicle charge points for local authorities, Energy Saving Trust (EST), 2023	Electric Vehicle Charging market study, Competition & Markets Authority (CMA), 2021
Electric Vehicles – Accessible Charging - Specification, the British Standards Institution (BSI), 2022	Commercial EV Fleet Charging Requirements, Energy Taskforce, 2021
Plugging the Gap, The Society of Motor Manufacturers and Traders (SMMT), 2022	Best Practice for Future Proofing Electric Vehicle Infrastructure, BEAMA (formerly British Electrotechnical and Allied Manufacturers' Association), 2020
Getting to the point: Accelerating EV charge point rollout through geospatial data, Geospatial Commission, 2022	Minimising the costs of street works and grid connections for electric vehicle charging infrastructure, Energy Saving Trust (EST), 2019

Good Practices in EV Charging

The Strategy also reflects guidance around 'good practices' from the following ten documents.

Table A.2: Summary of good practice guidance review

EVI guidance	Description
Public Charge Point Regulations 2023 Guidance, UK Department for Transport, July 2023	The legislation requires that: Public charge points should have a reliability standard of >99% for rapid chargers; All chargers that are >7 kW need to have a contactless payment within the next year; and EV charge point operators are required to be transparent with their pricing and should offer 24/7 helplines.
Energy Saving Trust – Procuring Electric Vehicle Chargepoints for Local Authorities	The report provides guidance on the different types of ownership models for EV charging infrastructure and considerations for Local Authorities when procuring EV charge point infrastructure.
Plugging the Gap, SMMT, 2022	The report provides an industry update on the uptake of EV. The report outlines updates regarding the transition to EVs and information on public charging infrastructure expansion and improving production of EVs to increase the supply chain.
Geospatial Commission - Getting to the Point, 2023	Outlines how location data can help build an EV charge point network that works for everyone, everywhere. The report concludes with the four challenges to effective EV charge point rollout that location data can help overcome: modelling future demand, finding suitable sites, creating a seamless consumer experience, and tracking rollout.
Zemo Partnership/Energy Taskforce – Commercial EV Fleet Charging Requirements	The report outlines solutions and recommendations for commercial EV fleet charging requirements. Recommendations include nationwide access to public charging networks, establish regional and local forums for data sharing, encourage fleet electrification and introduce local charging hubs.
Green Finance Institute – Charging Infrastructure	The report sets out policy recommendations to accelerate the transition to EVs. Highlighting the importance of a planned approach to EV infrastructure roll out, national infrastructure projects, addressing planning issues (grid upgrades and infrastructure roll out).
CMA – Electric Vehicle Charging Market Study 2021	The CMA market study provides recommendations following a detailed review of whether the EV sector can deliver to the scale and pace of investment needed and how people currently interact with the sector. Recommendations are related to speeding up grid connections and investing strategically whilst minimising connection costs.
BEAMA – Best Practice for Future Proofing Electric Vehicle Infrastructure	The report sets out planning considerations such as future proofing charge points and the importance of considering future proofing charge points and usability of charge points alongside recommendations. These include interoperability, roaming and payment systems capability, smart charging, data security, installation and operational, and planning and procurement of charge points.

EVI guidance	Description
Energy Saving Trust – Minimising the costs of street work and grid connections for electric vehicle charging infrastructure 2019	The report outlines various approaches to minimise the cost of street works and grid connections for installation EV charging infrastructure. For example, the type of equipment, the location, and local energy supply.
BSI – Electric Vehicles Accessible Charging Specification	The standard was published in October 2022. It is important to consider the cable length and appropriate cable management system when in-use and not in-use. For all public charge points, the charge point shall be positioned and oriented such that its components can be easily viewed, reached and operated from a seated or fully standing position by providing adequate spacing in front of the points of access to the charge point components.

B Emerging Charging Technologies

There are a range of other EV charge point innovations being trialled and piloted across the UK including recessed pavement gullies for charging cables, wireless charging, retrofitting petrol stations, electric forecourts and solar panel incorporation into charging. Examples of trials, along with advantages and disadvantages of these, are explored below.

Flat and flush chargers

Overview: These charge points do not require permanent raised street furniture at the pavement edge, which means they do not take up any space when not in use. Public charging solution developed with Innovate UK funding for individuals without off-street parking.

Advantages

No street clutter/car park clutter when not in use

Can be installed in areas without lampposts for on-street charging

Disability Rights UK provided design input to improve usability

Disadvantages

Limited commercial rollout at present

Installation could be more expensive compared to standard chargers

When in use this technology still represents additional street furniture

Trials and pilots

Trojan Energy Flat and flush charger – trialled in London Boroughs including Brent and Camden

Urban Fox Flat and flush charger – trialled in Oxford, Dundee, Plymouth and Staffordshire

Wireless ChargingOverview:

Wireless charging is an innovative technology solution which is being trialled in pilots globally and undergoing testing and development. The technology is not commercially or technologically ready due to EVs needing expensive retrofits to enable wireless charge.

Advantages

Eliminates the need for cables – removes concerns around street clutter and potential trip hazards

Removes the requirement to plug and unplug cables – improves accessibility for Disabled and older drivers

Disadvantages

Low technology readiness level

Requires vehicles to be retrofitted

Cost of wireless charging could be expensive

Trials and pilots

Nottinghamshire took part in a wireless charging trial (launched in October 2022), which will analyse nine electric taxis fitted with wireless charging hardware to assess its commercial and technical viability.

Smart Charging

Overview: A smart EV charging station is one that comes equipped with a set of advanced features that use the connection between your car, your home, and your electricity supply to leverage data and insights intelligently, optimise and personalise your charging sessions, and increase energy efficiency.

Advantages

Reduced costs: charge your vehicle when electricity prices are lower.

Convenience: programme your vehicle to charge at a time that suits the user.

Reduced emissions: take advantage of renewable energy sources during charging.

Grid stability: optimise charging speeds to avoid drawing excess energy from the grid.

In time, as identified in DfT's Smart Charging Action Plan[1], benefits can be realised by those without off-street parking when they use long-stay public charging.

Disadvantages

Higher cost of installation (compared to a conventional charger).

Interoperability concern if switching energy supplier.

Trials and pilots

National Smart Charging Trial (UK) between January 2017 to December 2018 including 673 smart chargers and 40 different types of EVs. The trial captured over 130,000 charging events, lasting two million hours.

From October 2021, the **Agile Streets** trial saw 100 Connected Kerb EV chargers deployed at 17 sites across four local authorities – Shropshire, Hackney, Glasgow and East Lothian. The trial demonstrated drivers could save over £600 a year in charging costs. It also showed peak energy demand would be reduced as much as 240MW.[2] The Energy Saving Trust indicated the trial could be rolled out further to realise the benefits at a larger scale.[3]

Vehicle-to-Grid (V2G) Charging

Overview: V2G is a form of smart charging that allows car batteries to give back the power to the grid. It is a form of two-way flow of electrical energy from the grid, via a smart charger, into an EV and back again.

Advantages

Balance electricity demand and avoid unnecessary costs (e.g. expanding the electricity network to meet peak demand).

Potential for users to earn revenue on energy markets by selling electricity

Disadvantages

Requires compatible EV and EV charger to make use of V2G, currently limited EV options available[4]

Bi-directional chargers are more expensive than regular EV chargers

Safety concerns of V2G systems

Standards around V2G are complex

Trials and pilots

OVO and Cenex undertook a trial with 320 homes from 2018 to 2021. The trial found savings up to £725 per annum per household. The trial recommended funding for V2G chargers to encourage EV uptake.[5]

Octopus undertook a trial in August 2022 where they charged and discharged the batteries of up to 20 electric cars from participating customers at times of grid imbalance. Octopus are working with industry with the trial learnings to further deploy V2G solutions.

Nottingham City Council installed V2G chargers at its Eastcroft waste transfer depot as part of CleanMobilEnergy project in March 2023.

1 DfT (2022) 'Electric Vehicle Smart Charging Action Plan'

2 Zap Map (2022) 'Agile Streets trial finds public smart charging saves drivers over £600 a year'

3 Fleet News (2022) 'Agile Streets public smart charging trial proves cost saving potential'

4 V2G Explained - Benefits of Vehicle-to-grid Technology — Clean Energy Reviews

5 Ovo (2021) 'World's largest domestic Vehicle-to-Grid trial reveals customers could recover the majority of their household energy costs'

Petrol Station Conversion / Retrofitting & Electric Forecourts

Overview: Consideration of retrofitting or converting petrol stations to accommodate EV charging infrastructure. An electric forecourt is an EV only charging station/hub akin to a petrol station. They typically offer ultra-rapid EV charging supported by a range of ancillary services.

Advantages

Provide a new convenience to consumers, helping retailers meet emission goals and even reduce demand for standard fuel.

Ability for customers to charge their vehicles quickly.

For converted petrol stations: in transition period, can provide additional revenue stream.

For converted petrol stations: some cost savings by using existing infrastructure.

Disadvantages

Grid capacity requirements.

Cost of implementation.

Trials and pilots

Petrol station retrofit: Shell Charging Hub, Fulham, London[1]

In 2022, Shell opened its first EV charging hub converting all petrol and diesel pumps to ultra-rapid charge points.

Features nine high-powered, ultra-rapid 175kW charge points.

Electric Forecourt: GRIDSERVE Electric Forecourt in Braintree, Essex

Capacity to charge 24 EVs at once with ultra-rapid charge points.

Powered by zero carbon solar energy and battery storage.

Range of facilities including coffee shop, supermarket, and airport-style lounge with high-speed internet and meeting rooms.

Incorporation of solar charging roofs

Overview: Incorporation of solar roofs / canopies within or in association with new EV charging infrastructure.

Advantages

- Environmental benefits by using renewable energy to charge the vehicle.
- Minimal maintenance associated with solar panel system.
- Cost savings on energy bills.

Disadvantages

- Installation costs
- Reliance on amount of daylight.
- May require battery storage system to store energy generated throughout the day (daylight).

Trials and pilots

Some CPOs have charging infrastructure that incorporates solar panels as part of their charge point design for example, in Braintree, Essex (see Electric Forecourt example above).

Some are shown below:

Ionity, Lake Garda (Italy)[2]: 18 high-power chargers offer up to 350kW charging capacity and are covered with a solar PV roof.

Fastned, Netherlands[3]: charging hubs across the Netherlands include a roof with glass solar panels and sustainable wood. Modular design enables them to be extended.

1 Shell (2022) 'Shell replaces fuel pumps with ultra-rapid charge points at first EV hub in Fulham, London'

2 The Driven (2023) 'Ionity opens largest EV ultra fast charging park, shaded by solar roof'

3 Fastned (2018) 'Fastned reveals new generation of fast charging stations'

C Funding Options for EVI Development

A range of UK government funding schemes are available for local authorities to support the rollout of EV infrastructure. The table below sets out funding options that are currently available to local authorities. Further and latest information can be accessed in the website: Electric vehicle grants - WEST (travelwest.info).

Table C.1: Funding options for local authorities (as of July 2024)

Funding Option	Description
Local EV Infrastructure Fund (LEVI)	The £450 million LEVI fund helps local authorities leverage private sector investment into their local charging networks and put in place long-term, sustainable charging infrastructure. It supports local authorities in England to work with the charge point industry to improve the rollout and commercialisation of local charging infrastructure. The funding includes: Capital funding to contribute to the costs of delivering charge points Capability funding for local authorities to employ and train new staff specifically to plan and deliver charge point infrastructure WECA is driving LEVI application and EVI development across the region, including in Bristol.
Workplace Charging Scheme (WCS)	This is a voucher-based scheme that provides support towards the up-front costs of the purchase and installation of electric vehicle charge points to businesses, charities, and public sector organisations. This scheme can help local authorities to electrify their own fleets and transition their staff to EVs. The grant covers up to 75% of the total costs of the purchase and installation of EV charge points (inclusive of VAT), capped at a maximum of £250 per socket and 40 sockets across all sites per applicant.
EV charge point grants for homes	Local authorities that own social housing can apply for the EV charge point grant for landlords. This provides grants of up to £350 towards the cost of purchasing and installing a charge point, with up to 200 grants a year available for each local authority. Additional support is also available for local authorities to help install EV charge points in the parking spaces in residential apartment blocks.
Rapid Charging Fund	The UK Government's £950 million Rapid Charging Fund will ensure that there is an ultra-rapid charging network along motorways and major A-roads ready to meet the long-term consumer demand for electric vehicle charge points ahead of need.
Developer Contributions	This is whereby local authorities leverage funding through Section 106 or Community Infrastructure Levy (CIL) to provide a dedicated pot of money towards EV infrastructure as part of new development requirements.

Incremental Funding Options for Local Authorities

Most public funding programs are designed not to cover all of the capital costs associated with EV charging infrastructure. In particular, the LEVI fund compels Local Authorities to accelerate development of public charging infrastructure while attracting private capital to commercially viable projects.

On their own, Local Authorities enjoy:

- a particularly clear perspective on emerging local demand for EV charging infrastructure
- land that is particularly well suited to the delivery of EV charging services (i.e., kerbs and car parks) and the right to license private operators on public land.

However, by entering into commercial engagement with privately-funded EV charge point operators, Local Authorities supplement these key resources with private capital and operating expertise in delivering charging infrastructure that satisfies driver demand while yielding to attract private capital.

Car club parking permit considerations

Some local authorities have combined their parking permit process for car clubs with a commitment to secure funding for an EV charge point from operators. For example, the London Borough of Kensington & Chelsea offer a £0 permit fee to car club operators (for 3 years) in return for implementing an EV charge point. However, margins with car clubs are low and the return on investment would likely make this an unattractive proposition for operators if there is insufficient demand for car clubs in the location.

Incremental Funding Options for Commercial Real Estate Operators

Like Local Authorities, commercial real estate operators also enjoy both a particularly clear perspective on emerging demand and land that is particularly well suited to delivery of EV charging resources (i.e., commercial and residential car parks, motorway service areas, etc). These operators host the balance of public charge point resources not otherwise located on Council land and often engage the project finance and operating expertise of charge point operators.

Incremental Funding Options for Businesses

Businesses seeking to engage workplace charging for staff and fleets enjoy access to two subsidy schemes including:

- **Electric vehicle infrastructure grant for staff and fleets:** The grant provides small and medium-sized businesses money off the cost of installing electric vehicle (EV) charge points and supporting infrastructure for their staff and fleet vehicles, and
- **Workplace Charging Scheme (WCS):** a voucher-based scheme for businesses, charities and public sector organisations that provides eligible applicants with support towards the upfront costs of the purchase and installation of electric vehicle (EV) charge points.

Incremental Funding Options for Residents

Residents seeking access to charging infrastructure also enjoy access to subsidy schemes including:

- Electric vehicle charge point grant for renters and flat owners: grant provides EV drivers who are renters or own a flat with support towards the costs of the purchase and installation of EV charge points. One can get either £350 or 75% off the cost to buy and install a socket, whichever amount is lower, and
- Electric vehicle charge point and infrastructure grants for landlords: Grants for landlords to install EV charge points and supporting infrastructure in rental and leasehold properties. There are two types of grants available for properties one owns:
  - EV charge point grant – this is similar to the grant amount for renters and flat owners where one can get either get £350 or 75% off the cost to buy and install a socket, whichever amount is lower, or
  - EV infrastructure grant – in this case, a building owner can get 75% off the cost up to a maximum of £30,000 if providing EV infrastructure in residential car parks. The amount depends on how many parking spaces the grant covers (up to £500 per parking space enabled with supporting infrastructure). This grant does not apply to a commercial landlord.

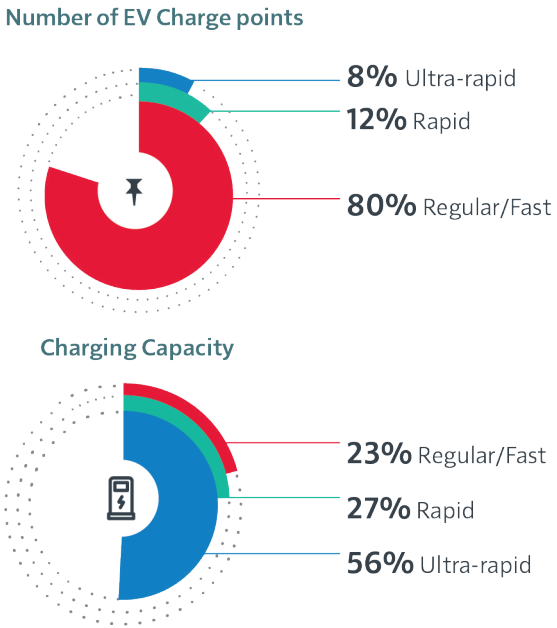
Incremental Funding Options for Drivers

Many cite the higher retail prices of EVs as a deterrent to their uptake. In response, the UK Government has established a tax subsidy scheme for employees and their employers seeking to expand the uptake of EVs. Drivers participating in company car or salary schemes sponsored by their employers enjoy a 0% Benefit in Kind rate on taxes associated with the use of an EV, reducing their effective cost of the vehicle.

D EVI Scenarios and Forecasts

It is expected that a vast majority of EV charging will be done where vehicles are parked the majority of the time (overnight) using low powered charge points, either at home or on-street. However, Figure D.1 (derived from Zap Map data) indicates that only about 23% of the total charging demand is met by regular/fast chargers (typically <22kW).[1] [2]

Figure D.1: UK EV charge point distribution by charging type



This suggests, to an extent, that drivers prefer rapid/ultra-rapid charging over regular/fast charging. This could be due to the fact that early adopters of EVs are more likely to have home chargers to satisfy the majority of their charging demand, only requiring public infrastructure for rapid top-ups on longer distance trips. They are also most likely insensitive to charging costs, therefore the higher kW price for rapid/ultra charging compared to fast do not deter them from using them. If this is the case the trend and preference for charging type could change as EV share in total registered vehicles increases.

Over uncertainty about user charging preference, we have developed three potential scenarios on consumer preferences on how they would prefer to charge their vehicles and estimated the number of different types of EVI that will be needed to meet the charging demand in each scenario. The three scenarios are:

- **Balanced** scenario, where it is assumed that private car owners prefer to charge their vehicles using low powered/standard charge points the majority of the time. Whilst the van owners secure majority of power from rapid/ultra charge points. This is because the vans typically make higher mileage than cars and require quick and reliable charging. This is the most likely scenario.
- **On-street preferred** scenario, where it is assumed that the van users behave in the same way as car users, and both types of users will secure majority of their power from low powered/standard charge points; and
- **Rapid preferred** scenario, where it is assumed both car and van users choose to secure the majority of their charging needs from rapid/ultra charge points.

1 EV charging statistics 2024 - Zapmap (zap-map.com)

2 Utilisation of the different types of charge points has been shown to be largely the same Zapmap & The Green Finance Institute reveal charge point utilisation across the public network - Zapmap (zap-map.com)

All scenarios assume that cars and vans that have access to a private home/depot charging will charge privately the majority of the time. A summary of assumptions for the three scenarios is presented in Table D.1.

Table D.1: Assumptions for EVI development scenarios based on consumer preferences

EV user type	Balanced scenario	On-street preferred scenario	Rapid preferred scenario
Private car with access to off-street parking	80% charging at home (private) 20% charging on-route using rapid/ultra	Same as balanced scenario	Same as balanced scenario
Private car without access to off-street parking	80% charging on-street using standard/fast 20% charging on-route using rapid/ultra	Same as balanced scenario	20% charging on-street using standard/fast 80% charging on-route using rapid/ultra
Vans with access to off-street/ depot parking	80% charging at home/depot (private) 20% charging on-route using rapid/ultra	Same as balanced scenario	Same as balanced scenario
Vans without access to off-street/ depot parking	20% charging on-street using standard/fast 80% charging on-route using rapid/ultra	80% charging on-street using standard/fast 20% charging on-route using rapid/ultra	Same as balanced scenario

EVI Forecasts

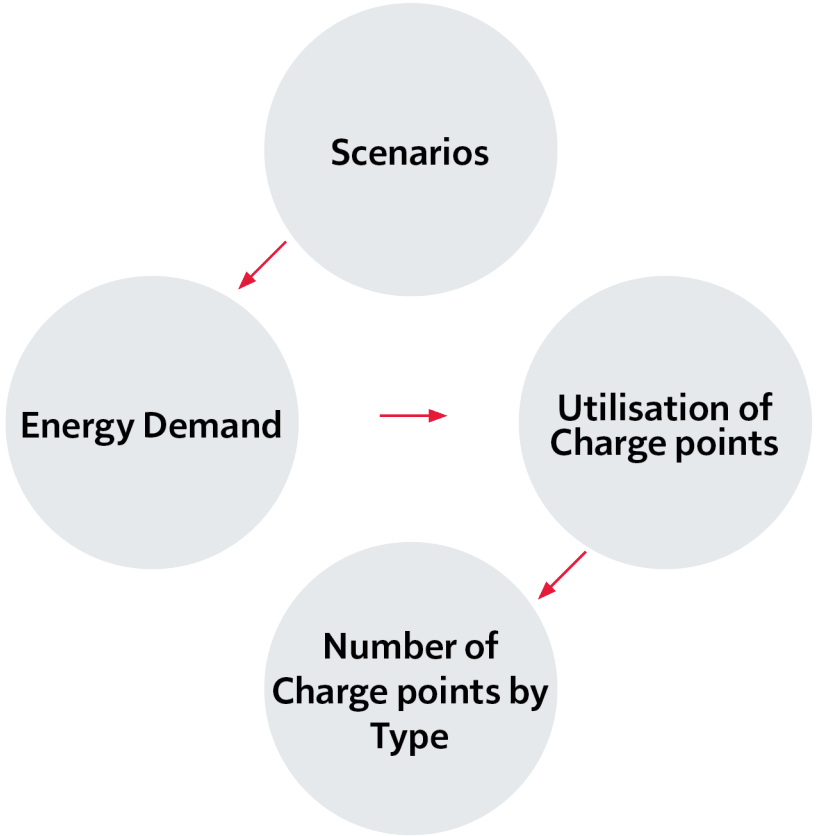
The percentage of energy demand by EVs from public EVI depends on the share of EVs owned by households that enjoy access to convenient and relatively inexpensive private off-street or at home charging resources. The RAC reports that 53% of Bristol homes have access to private off-street parking.

We assumed that early adopters of EVs are households with access to private domestic charging and are not reliant on public EVI to meet the majority of their charging needs. However, as EVs are adopted more widely, more EV owners are likely to lack off-street parking and would be reliant on public EVI. We also apply a broader estimate of 20% of vans having access to private off-street or depot-based charging.

Depending on the scenario, the forecast for the number of public charge points is a function of:

- Total energy demanded (gWh) from the type of public EVI (fast/standard and rapid/ultra)[1]
- Expected utilisation of the public EVI (i.e., kWh energy supplied per charge point per day)

Utilisation of charge points is driven by the pace of EV adoption compared to growth in the number of public charge points. As EV adoption continues to grow, we assume growth in utilisation will peak at 20% (i.e. charge points will be used 20% of time during a day).



1 Based on average annual mileage of 7,400 miles for cars and about 15,000 miles for vans (DfT pre-covid 2019 data), annual energy demanded by these EVs in Bristol will be approximately 25gWh in 2025, which will double by 2027 to about 50gWh and reach 475gWh by 2036.

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