Hertfordshire County Council: EV Charging Strategy

Hertfordshire County Council
County Hall
Pegs Lane, Hertford
Hertfordshire SG13 8DQ
United Kingdom

Telephone: +44 1992 555 555
Website: www.hertsdirect.org

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Prepared By

Anna Cuckow (WSP), Dermot Dooher
Author's name
Author's title

Hertfordshire County Council
County Hall
Pegs Lane, Hertford
Hertfordshire SG13 8DQ
United Kingdom

Reviewed By

Reviewer's name Sue Jackson
Reviewer's title Group Manager Transport Strategy

Telephone: +44 1992 555 555
Website: www.hertsdirect.org

Date: October 2022
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Approved for Release By

Approved for release name
Approved for release title

Reference

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1 Introduction and Background Context

1.1 Background

Given international, national and Hertfordshire County Council's commitments to achieving 'net zero' carbon emissions by 2050, and planned phase out new petrol and diesel cars and vans by 2030, there is a clear rationale for supporting the uptake of electric vehicles (EVs) within Hertfordshire.

Transport is the largest contributor to UK domestic carbon dioxide (GHG) emissions, responsible for 33% in 2019. Cars and taxis accounted for 55% of emissions, and light vans for a further 16%.[1]

Emissions of nitrogen oxides (NOx[2]) and particulate matter from vehicle exhausts are key sources of air pollution. As electric vehicles emit zero emissions at the tailpipe, encouraging and enabling residents and businesses to switch to EVs will reduce carbon emissions and help improve air quality.

Between 2030 and 2035, only new cars and vans with 'significant zero emission capabilities' can be sold.[3] This is likely to include some hybrids and plug-in hybrids, but the government has not yet announced the definition of this term following various consultations.[4] From 2035, only new, fully zero emission cars and vans can be sold, likely to equate to battery EVs only and hydrogen fuel cell vehicles.

This strategy sets out Hertfordshire County Council's actions to lead and enable the roll-out of public EV charging infrastructure to facilitate this transition.

Our vision for Hertfordshire's EV charging network is:

To enable residents and businesses across Hertfordshire to recharge their vehicles conveniently, and appropriately. This will facilitate the conversion of vehicles to meet Hertfordshire's climate and air quality commitments and prepare drivers for the phase out of new petrol and diesel cars and vans in 2030 when around 30% of the fleet is expected to be electric.

This strategy follows a draft position on EV charging which was taken to Hertfordshire's Highways and Transport Panel in June 2021. This presented the vision for the future of EV charging in Hertfordshire and set out several draft positions around the deployment of EV charging

[1] DfT (2021). Table ENV0201. Greenhouse gas emissions by transport mode: United Kingdom. Available at: https://www.gov.uk/government/statistical-data-sets/energy-and-environment-data-tables-env#greenhouse-gas-emissions-env02

[2] Emissions of air pollutants in the UK – Nitrogen oxides (NOx) - GOV.UK (www.gov.uk)

[3] https://www.gov.uk/government/news/government-takes-historic-step-towards-net-zero-with-end-of-sale-of-new-petrol-and-diesel-cars-by-2030

[4] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1067018/outcome-and-government-response-to-the-green-paper-on-a-new-road-vehicle-co2-emissions-regulatory-framework-for-the-uk.pdf

infrastructure. Following this there was the establishment of a joint working group with District and Borough Councils and dialogue with key industry stakeholders such as Chargepoints operators, electricity suppliers and the Energy Savings Trust. These discussions have helped us develop and refine the strategy. The strategy scope, broad approach and roles and responsibilities were then approved by the Hertfordshire County Council Highways and Transport Panel in September 2022, and these have been used as the framework for this strategy.

1.2 Overview of EV market

The EV market is fast-evolving, with sales of vehicles growing rapidly. An increasing range of electric models are available, providing greater choice for consumers at a range of price points.

There are two major types of EVs:

- Battery Electric vehicle (BEVs): A vehicle that runs on electricity only, using a powerful electric motor(s) and large battery to power the vehicle, which needs to be charged by the user.
- Plug-in Hybrid vehicles (PHEVs): A vehicle that has a petrol or diesel engine combined with an electric motor, but with a larger battery to provide a electric-only range. This needs plugging-in to recharge. Typically, PHEVs have an electric-only range of 30 to 40 miles, and fuel economy suffers if battery is not regularly charged.[5]

Ultra-low emission vehicles (ULEVs) are any vehicle that emits less than 75g per km of CO2 from the exhaust when driving, and include BEVs and PHEVs.

Hybrid vehicles, including ‘mild’ or self-charging hybrids, are not classed as ULEV, EVs or zero emission (ZE) vehicles as they have very small batteries and no or very limited zero emission ranges. They are refuelled with petrol and diesel and cannot be plugged into an EV Chargepoints.

1.3 Benefits and barriers to EV uptake

The recognised benefits of EVs include:

- Zero tailpipe emissions helping to decrease the impact on the environment and reduce personal carbon footprint
- Electric vehicles have fewer mechanical components resulting in lower servicing and maintenance costs running costs
- Smooth driving experience and reduced noise pollution.
- All electric vehicles have a zero rate of vehicle excise duty
- Cheaper to refuel than petrol or diesel with cost savings at their highest when owners charge at home and have access to an off-peak overnight electricity tariff
- Discounts and exemptions within clean air zones throughout the UK and London’s ultra-low emission zone (ULEZ)

5 https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=&ved=2ahUKEwjko6nmjYj6AhW6SkEAHTZEASAQFnoECA4QAQ&url=https%3A%2F%2Fwww.zemo.org.uk%2Fassets%2Fother%2FZemo_powertrain_consumer-friendly_definitions_2021.pdf&usg=AOvVaw3yp_2QugC5oyxrbG7yLnfM

There are however a number of barriers to EV uptake by individuals, both real and perceived, that need to be overcome to encourage mass adoption. Table 1.1 summarises those identified in research by TRL[6] and potential mitigations.

Table 1.1 - Barriers to EV adoption, and mitigations.

Barrier	Description	Mitigation
Awareness & knowledge	• Consumers and fleets need adequate awareness and knowledge of EVs, such as how the technology works, how and where to charge, what vehicle models are available, and where to find more information.	• DfT recently released an information leaflet addressing misconceptions about EVs.[7] • Information is available on the Hertfordshire Council website www.hertfordshire.gov.uk/electricvehicles and through organisations such as EV Association England.
Financial factors	• These include the high initial purchase price, running costs (and Total Cost of Ownership, TCO), financial incentives, and vehicle depreciation.	• Depending on fuel and electricity prices, and the number of miles driven, higher purchase prices can be recouped through lower running costs of EVs. • For many people, leasing and salary sacrifice schemes through an employer can be routes to driving an EV. • As EVs sales increase, greater volumes will feed through the used car market. In August 2022, used EV transactions rose 57%.[8]
Charging infrastructure	• Availability of and access to charging infrastructure is a critical barrier to adoption. • Access to charging is needed at or near home, at work, and at major roads and motorways to enable long journeys.	• As of August 2022, there were 33,996 charging points across the UK (devices), at over 20,5000 locations, an 34% increase since August 2021. [9] • This strategy sets out plans to grow Hertfordshire's public charging network.

[6] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/914111/driving-and-accelerating-the-adoption-of-electric-vehicles-in-the-uk.pdf
[7] https://www.gov.uk/government/publications/common-misconceptions-about-electric-vehicles
[8] https://www.smmt.co.uk/2022/08/used-car-market-falls-despite-electric-boost/
[9] https://www.zap-map.com/statistics/

Vehicle attributes	• This includes range anxiety' (concern about how far can be driven before recharging), long charging times, long-term battery performance, and other concerns related to novelty and inexperience with EVs.	• 99% of car journeys in England are under 100 miles, meaning most drivers' needs are easily met by an EV. There is also major investment in high-powered charging at motorway service stations. • Battery technology is developing rapidly, and battery prices are falling. • A local coherent, convenient charging network will encourage people to adopt different refuelling habits. • Opportunity to test drive vehicles

Source: Adapted from TRL Driving and accelerating the adoption of electric vehicles in the UK, final report, July 2020.

1.4 Overview of charging

Chargepoints are predominately categorised by their power rating, in kW, which determines how quickly they can recharge a vehicle. **Error! Reference source not found.** describes the main t ypes of chargepoints.

Unlike refuelling a petrol or diesel vehicle at a forecourt where the emphasis is on speed, recharging an EV can take advantage of the length of time vehicles are typically parked. According to the RAC Foundation, the average car is parked at home for 80% of the time, parked elsewhere for 16% of the time and is only on the move for 4% of the time.[10]

To date most EV recharging has been undertaken overnight on slower chargepoints (under 22 kW), with regular 'top-ups' every couple of days, rather than empty-to-full recharges, depending on an individual's journey patterns. There is however emerging evidence that drivers are increasingly undertaking regular top up charges and are becoming less reliant on longer duration full charges.

Slower charging is likely to remain an important part of the charging network as it is both cheaper for the user (a lower electricity tariff) and the chargepoints units are much cheaper to install, compared to rapid chargepoints for the council and private sector. While the National Grid has provided assurances that the electricity grid will cope with the extra demand from EVs, slow charging also helps to reduce the impact, especially at peak times.[11]

Until recently, few EVs were able to support ultra-rapid charging rates (50 kW to 350 kW), but the newest, high-end vehicle models on the market are increasingly able to charge at 100 kW. These charging units are however very expensive to install and often have premium tariff rates so are unlikely to be used for regular, everyday charging in the near future.

[10] https://www.racfoundation.org/research/mobility/spaced-out-perspectives-on-parking

[11] Especially in conjunction with smart charging. https://www.nationalgrid.com/stories/journey-to-net-zero-stories/can-grid-cope-extra-demand-electric-cars
https://www.nationalgrideso.com/future-energy/net-zero-explained/electric-vehicles/evs-electricity

In summary, the range of charging solutions for EVs is evolving, reflecting ongoing technological developments and increasing investment in the sector, as well as the needs of different users.

Table 1.2 – Categorisation of types of chargepoints

Chargepoints Type	Max Power Output Kilowatts	Current/Supply Type	Charging duration (40kWh battery)
Domestic socket (see illustration 2a below)	2.3-3kW	AC – Single Phase	Approx. 17 hours
Slow	3.7kW	AC – Single Phase	Approx. 11 hours
Fast (see illustration 2b below)	7.4kW		Approx. 6 hours
	11-22kW	AC – Three Phase	Approx. 2-4 hours
Rapid	43kW	AC – Three Phase	Approx. 55 mins
	20-50kW	DC	Approx. 40 mins
Tesla Super Charger (see illustration 2c below)	75-250kW	DC	Approx. 10-20 mins
Ultra-rapid (see illustration 2d below)	50kW-350kW	DC	Approx. 7-16 mins

2a. Example of domestic socket/home charger

2b. Example of fast charger

2c. Example of Tesla Super charger

2c. Example of ultra-rapid charger

Most EV drivers (the early adopters) currently charge at home off-street via a private slow chargepoints (<7 kW) on their driveway or in a garage that is connected to their home electricity supply. In 2019 this accounted for approximately 62% of all charging nationally.

However, proportionally, the share of charging across these charging location types is expected to decrease in future. There will be greater demand for charging points in car parks and charging hubs, as well as other destinations and on-street locations as more households without access to off-street parking purchase or lease EVs and will rely on publicly accessible chargepoints to meet all their charging needs.

The best type (power rating) of chargepoints for a particular location depends on a wide range of factors, including length of time vehicles are typically parked, the available electricity grid capacity, land and parking availability. Table 1.3 summaries the features, current and projected share of

different types of charging location. These are explored in more detail in later sections of this strategy.

Table 1.3 – Summary of different charging locations

Charging location types			Approximate share of charging demand (2019) [12]	Approximate share of charging demand (2028)
	**Off-Street home charging**	Private home-based charging includes driveways, garages and off-street residents' parking. This is typically the cheapest and most convenient option. A recent initiative is the development of platforms such as Zap Home peer to peer network allowing the sharing of privately owned chargepoints.	62%	38%
	**Residential on-street and residential off-street charging hubs**	Chargepoints installed to serve vehicles parked on-street, either in standalone units or integrated into existing street furniture (e.g. lampposts), or in communal parking areas (e.g. car parks). Vehicles are typically recharged slowly, often overnight.	19%	22%
	**En-route charging**	En-route charging describes locations such as public chargepoints at motorway service stations and petrol stations. Typically used for longer journeys, or where a quick turnaround charge is required.	8%	8%

[12] https://innovation.ukpowernetworks.co.uk/wp-content/uploads/2019/11/UK-Power-Networks-Electric-Vehicle-Strategy-November-19.pdf

	**Workplace Charging**	Workplace charging where available is a convenient option for employees, and well suited to the long dwell times characteristic of workplace parking, as well as the availability of private parking. Increasingly fleet vehicles are switching to EVs, which are often charged at the workplace.	6%	19%
	**Destination Charging**	Destination charging sites are publicly accessible sites where the driver has chosen to go to a site for other purposes, i.e. somewhere they would already have parked, such as a supermarket, railway stations, retail, leisure, hotels etc.	4%	9%

Local data has recently been collected through the Hertfordshire County Travel Survey. Of the respondents in households with at least one fully electric vehicle, almost all (93%) charged their vehicles at home. In addition to charging at home the following other facilities were used:

- 23% charged at work
- 19% charged at service / fuel stations
- 11% charged on street
- 7% charged in car parks

This strategy focuses on actions to increase the provision of residential chargepoints both off street and on street.

1.5 Private sector investment and market trends

Other types of charging (eg destination and en route charging) tend to be provided by the private sector. In recent years, there has been significant investment by the private sector into chargepoints operators, including through the Charging Infrastructure Investment Fund[1], and through multiple high-level acquisitions and partnerships, such as EDF acquiring Pod Point, Shell acquiring Ubitricity and Total acquiring Source London. This is enabling the widespread expansion of the UK's network, including on privately owned land (e.g. fuel stations, retail centres).

This provision is a key part of growing the publicly accessible EV network to keep pace with growing EV demand and complement public sector-led provision.

Engagement with the private sector is a critical part of understanding and addressing the levels of demand, whilst ensuring an overarching view of the total publicly accessible EV network is maintained by HCC to help inform action plans and strategies. HCC will therefore continue to engage with the private sector, seeking opportunities to collaborate where possible, as detailed through the actions set out in Section 8 of this document (Influencing the private network).

1.6 Emerging and Future charging technologies

EV charging is a rapidly evolving sector, with many new technologies at various stages of design, trials, and commercial deployment. HCC will monitor the opportunities offered by these emerging technologies for public charging and review delivery plans as appropriate.

Future charging options may include:

- **Vehicle to Grid (V2G):** A system which enables EV batteries to be used to store energy, which is discharged to power a home, workplace or to the grid during times of high demand. The EV battery is recharged at off-peak times.

- **Wireless (inductive charging):** Recharges EV batteries without a physical connection between the vehicle and chargepoints unit. Power is transferred by electromagnetic induction from a chargepoints fitted into the road surface to a receiver fitted under the car.
    - Likely applications include taxi ranks[13] and charging for drivers with disabilities. It may also suit some on-street residential settings, car clubs[14] and autonomous vehicles.

- **Dynamic charging:** Enables an EV to be continuously charged as it is being driven, using electrical transmitter coils beneath the road surface.
    - It is at an earlier stage of development that static or stationary wireless charging.
    - Applications may include charging for heavy goods vehicles and buses.

- **Battery swapping:** EV drivers or operatives exchange their depleted batteries for a fully charged replacement.
    - There are however issues with lack of standardisation of battery packs and the expense of establishing a dense network of battery swapping stations.

1.7 Micromobility (e bikes and e scooters)

Micro-mobility (such as e-bikes and e-scooters) is becoming increasingly popular as a low cost and low carbon alternative to cars. In Hertfordshire an estimated 63% of all trips are under 5 miles with most of these trips dominated by cars. For larger towns, cycle to work rates among people

[13] https://www.fleetnews.co.uk/news/fleet-industry-news/2020/01/17/electric-taxi-wireless-charging-trial-in-nottingham

[14] Char.gy, a chargepoint operator, was awarded over £2.3 million by Innovate UK to demonstrate wireless charging on residential streets in Milton Keynes, the London Borough of Redbridge and Buckinghamshire, using 10 retrofitted car club vehicles. https://www.fleetnews.co.uk/news/latest-fleet-news/electric-fleet-news/2021/10/11/chargy-and-hiyacar-launch-wireless-charging-electric-vehicle-trial

who live and work in the same town are less than 6%[15]. While the transition to EVs will help reduce the environmental impact of such trips, a shift away from traditional motor transport for short journeys will be required in order to deliver on carbon emission reduction targets. Micro-mobility has the potential to provide a solution to these shorter journeys by helping to reduce car usage and ownership, whilst encouraging cycling and promoting healthier and more sustainable travel. A 2021 survey by CoMoUK reported that 34% of respondents who have used e-bikes said they were replacing more than 5 miles of car travel per week with e-bikes with an additional 29% reporting that access to e-bikes had resulted in them riding much more often[16].

Key features of E bikes end E scooters are as follows:

- **E-bikes**: Electric bicycles and electric scooters represent the fastest growing mode of micro-mobility[17]. E-bikes have removable batteries which can be charged into a regular plug socket (which generally take about 4-5 hours to charge providing peddle power for 25-100 miles) and if the battery runs out it can still be peddled like a regular bike[18]. E-bikes are becoming an increasingly popular and common form of shared mobility, providing an alternative to car travel and offering benefits that have the potential to help people re-engage with cycling by reducing journey times and supporting people with health issues or low levels of fitness.
- **E-scooters:** Like e-bikes, e-scooters are fitted with an electric motor and battery. The range and charge times vary significantly depending on the model, battery size and journey (e.g., the battery won't last as long on hilly routes) with charge times ranging from a few hours to a full day[19]. Presently, privately owned e-scooters are not legal on public roads, cycleways or pavements. Rental electric scooters are currently the only way to legally ride an e-scooter with several trials currently underway across the UK which HCC are monitoring closely.

Given the range (miles) of the average e-bike/scooter and nature of the average trip (up to 5 miles) it is unlikely that extensive charging infrastructure would be required. Most e-bikes/scooters have detachable batteries which enable easy home/workplace charging with the option of having additional batteries that can be swapped in and out to enable a quick turnaround. This is the preferred method of charging for bike share schemes such as the Beryl bike scheme in Watford (which now operates 100 e-bikes). Rather than installing and relying on charging infrastructure, the Beryl bikes have their batteries swapped on street whilst the spent batteries are taken back to the depot to be recharged, removing the need for dedicated charging infrastructure.

Micro-mobility represents an important part of the overall EV network and so all forms of charging and charging infrastructure (such as docking/charging bays or scooter storage with power options) should be considered as part of any multi-modal hubs and/or in key locations where demand has been identified. If dedicated charging infrastructure is required then the **on-street siting criteria** (appendix 1) should be applied to ensure safe, consistent and appropriate levels of provision.

[15] LTP4 Transport Plan 2018 (hertfordshire.gov.uk)
[16] Shared bikes > Overview and benefits (como.org.uk)
[17] Our position on micromobility - Sustrans.org.uk
[18] A guide to electric bikes - Energy Saving Trust
[19] Electric Scooter Safety | Are Electric Scooters Legal? - Which?

1.8 Strategy content

EV charging is a rapidly evolving sector and there are a number of challenges related to the provision of new EV charging infrastructure. This strategy sets out the vision, objectives and scope of HCCs strategy for working with districts and boroughs to identify and fill gaps in the EV charging network (Section 2).

It considers how EV charging infrastructure needs to be considered within the local policy context (particularly the user hierarchy in LTP4) and sets out the opportunities and challenges presented by EV charging before presenting baseline figures on EV takeup and chargepoints and estimated forecasts of the future chargepoints requirements along with the different options for providing these. Processes for the installation of chargepoints are then covered in Section 7 and later sections give an overview of the private charging network, funding and delivery models and chargepoint provision in new developments. The report then concludes with an action plan to enable EV transition and some indicative performance metrics.

2 Hertfordshire EV Vision and Objectives

2.1 Vision

Our vision for Hertfordshire's EV charging network is:

To enable residents and businesses across Hertfordshire to recharge their vehicles conveniently, and appropriately. This will facilitate the conversion of vehicles to meet Hertfordshire's climate and air quality commitments and prepare drivers for the phase out of new petrol and diesel cars and vans in 2030 when around 30% of the fleet is expected to be electric.

2.2 Objectives

To deliver this vision, a number of short-term objectives for HCC (over the next 5 years) have been identified as follows:

- To facilitate collaboration across the county and provide guidance for districts and boroughs on chargepoints delivery and best practice
- To identify where council-led infrastructure delivery is needed strategically to complement private sector-led installations.
- To work alongside Districts and Boroughs to support the development of an EV charging network which promotes equal access to EV charging including for those in rural and more remote locations and areas of deprivation based on available evidence of EV charging need
- To support the adoption of consistent standards across the county to ensure the best outcome for drivers and efficient use of resources.
- To investigate the potential for delivery of chargepoints on highway land assets held by the county council, in partnership with the private sector.
- To keep up-to-date with chargepoints market innovation and policy developments to enable Hertfordshire's approach to be refined as consumer behaviour and market trends evolve.

In order to facilitate the development of a comprehensive chargepoints network a series of complementary objectives for districts and boroughs have been identified as follows:

- To deliver chargepoints to unlock EV uptake for households without off-street parking and at the pace required to meet forecasted charging demand
- To secure central government grant funding and leverage private sector investment
- To ensure a high-quality experience for drivers and the development of an accessible network
- To support collaboration and knowledge-sharing across the county
- In their role as Local Planning Authority to ensure all new homes and commercial developments have appropriate EV charging provision.

The Hertfordshire Climate Change and Sustainability Partnership also set out a range of objectives related to transport as follows:

a) Deliver net zero carbon emissions for local authority transport operations by 2030

b) Work towards zero carbon emissions for Hertfordshire's transport network by 2050

c) Embed sustainable transport policies in Local Plans and prioritise the needs of sustainable travel within every planning decision

d) Only support new developments where they will have full sustainable transport access
e) Systematically pursue opportunities for active travel in everything we do

f) Look to reduce air pollution arising from local transport sources

g) Promote a shift to active travel and public transport through behaviour change campaigns and infrastructure improvements

h) Facilitate a move to BEV for taxis across the county

i) Facilitate appropriate EV charging networks across Hertfordshire

j) Maintain an open mind and investigate the potential for new technologies as they arise

2.3 Scope of Strategy

At this stage the strategy covers the provision of **publicly available** Electric Vehicle chargepoints (including provision for Electric bikes and other mobility options as they become mainstream). Provision for specialist fleet vehicles and buses is being investigated through other programmes of work (e.g. HCC Fleet Vehicle working Group and the Zero Emissions Bus fund (Zebra.

We recognise that the development of new residential and non-residential buildings presents an opportunity to increase the provision of EV charging infrastructure. Whilst this is ultimately a decision for the Local Planning Authorities (LPAs) HCC will work closely with them to ensure EV charging infrastructure is an integral part of development design and our emerging Place and Movement Design Guide sets out aspirations for the provision of new Chargepoints reflecting the new National building regulations.

This strategy sets out a longer-term vision to 2030 supported by shorter-term actions in the form of a 1–2-year delivery plan. This enables us to be flexible and respond to market developments in a rapidly changing sector). The intention is to revisit the strategy and action plans and update them as appropriate as technology and consumer behaviour evolves.

The strategy development has been informed by discussions with key stakeholders such as Districts and Boroughs, the electricity network operator (DNO) UKPN, the Energy Saving Trust and a variety of chargepoints operators.

Successful delivery of the strategy will depend on continued engagement and partnership working with these key groups.

3. Policy Context

Investment in publicly accessible EV chargepoints is closely aligned with international, national, regional, and local policies and legislation.

There is strong political support for the transition to EVs and development of the charging infrastructure, and an increasingly well-defined role for local authorities to play.

3.1 International and National Policies

The UK was the first major economy to set legally binding carbon budgets (amounts by which greenhouse gas emissions must come down, and by when). By law the UK's emissions must now be net zero by 2050.

The UK Government has set out a road map for the phase out of all fossil-fuelled vehicles, providing a strong signal to the automotive market, industry and drivers. By 2030, the Government will end the sale of new conventional petrol or diesel cars and vans (up to 3.5t), although second-hand petrol and diesel cars and vans can continue to be sold. Hybrid cars and vans with "significant zero emission capability" can be sold until 2035.[20]

Figure 3.1 provides an overview of the phase out dates for all vehicles, including motorbikes, HGVs and buses.[21] Similar commitments have been made by governments and vehicle manufacturers internationally.

It is clear that the transition to EVs is gathering pace and Hertfordshire's local authorities have a key role to play in enabling residents and businesses across Hertfordshire to transition to zero emission vehicles

[20] https://www.gov.uk/government/news/government-takes-historic-step-towards-net-zero-with-end-of-sale-of-new-petrol-and-diesel-cars-by-2030

[21] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1063585/non-zero-buses-coaches-minibuses-consultation.pdf
https://www.gov.uk/government/consultations/heavy-goods-vehicles-ending-the-sale-of-new-non-zero-emission-models
https://www.gov.uk/government/news/government-takes-historic-step-towards-net-zero-with-end-of-sale-of-new-petrol-and-diesel-cars-by-2030

Figure 3.1 – Road map for phase out of fossil fuelled vehicles

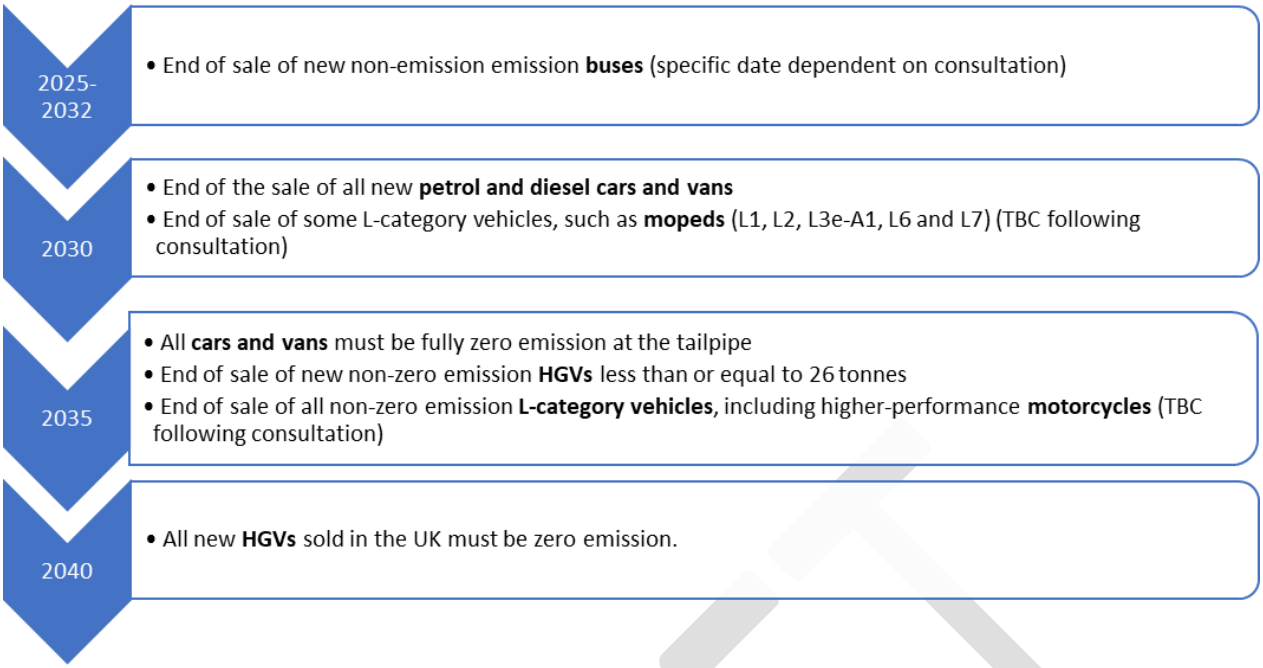


Table 3.1 summaries the international and national policies which are driving the transition to electric vehicles in order to decarbonise the UK economy and improve air quality.

Table 3.1 – Summary of major international and national policies supporting the EV transition

Policy Level	Policy Document	Summary	Policy Fit
International	COP 21 Paris Agreement (2015)[22]	Goal of keeping global average temperatures to well below 2°C above pre-industrial levels, and ideally within 1.5°C.	Support for decarbonising transport systems.
	COP26 Glasgow (2021) Pact[23]	Reaffirmed goal of 1.5 oC. Over 30 countries, six major vehicle manufacturers and other actors, like cities, set out their determination for all new car and van sales to be zero emission by 2040 globally and 2035 in leading markets.	Global commitment to transition to EVs from governments, vehicle manufacturers and other actors, such as fleets.

[22] https://unfccc.int/process-and-meetings/the-paris-agreement/the-paris-agreement
[23] https://ukcop26.org/wp-content/uploads/2021/11/COP26-Presidency-Outcomes-The-Climate-Pact.pdf

National	Taking Charge: The Electric Vehicle Infrastructure Strategy (March 2022)[24]	Sets out a vision and action plan for the rollout of EV charging infrastructure in the UK up to 2030, including identifying roles and responsibilities for local authorities.	Support for local authority involvement in the deployment on public charging infrastructure, alongside private sector investment.
	Decarbonising Transport: A Better, Greener Britain[25] (July 2021)	Commitments and the actions needed to decarbonise the entire transport system in the UK by 2050. This includes accelerating modal shift to public and active transport and decarbonising road transport through EVs.	Sets out phase out dates for non-zero emission vehicles, major investment in charging infrastructure and outlines a world-leading regulatory framework.
	Net Zero Strategy: Build Back Better[26] (October 2021)	Sets out UK's decarbonisation pathway to 2050. Reiterates phase out dates for cars and vans, and commits to invest an additional £620 million to support the transition to EVs. Introduces a zero-emission vehicle mandate, which will set targets for a percentage of manufactures' new car and van sales to be zero emission from 2024.	Strong signal to vehicle manufacturers and investors.

[24] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065576/taking-charge-the-electric-vehicle-infrastructure-strategy.pdf

[25] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1009448/decarbonising-transport-a-better-greener-britain.pdf

[26] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf

	Ten Point Plan for a Green Industrial Revolution[27] (November 2020)	Announcement of end the sale of new petrol and diesel cars and vans by 2030.	Significant driver of EV uptake and market change.
	Clean Air Strategy (January 2019)[28]	Sets out how the government will tackle all sources of air pollution, including from transport through Clean Air Zones in targeted areas.	Support for EVs as a lever to improve air quality.
	Changes to Building regulations - Infrastructure for the charging of electric vehicles[29] (In force 2022)	Sets out requirements for Chargepoints for all new residential and non-residential buildings.	Support for home Chargepoints.

3.2 Regional Policies

England's Economic Heartland (EEH) are the sub national transport body for the region including Hertfordshire and have a key role in advising the Secretary of State for Transport on the investment requirements for the region.

EEH have developed an overarching regional transport strategy 'Connecting People, Transforming Journeys' [30]which is a 30-year strategic vision for the area and provides a framework for sub regional investment and planning going forward with a focus on enabling economic growth in a way that delivers a net zero transport system by as early as 2040.

The overarching vision is 'to support sustainable growth and improve quality of life and wellbeing through a world class decarbonised transport system which harnesses the region's global expertise in technology and innovation to unlock new opportunities for residents and businesses in a way that benefits the UK as a whole'

The strategy recognises that whist electrification of the road fleet will make a positive contribution towards reducing carbon emissions it will not address wider concerns resulting from the use of vehicles and therefore it needs to form part of a coordinated approach to investment that seeks to reduce the overall number of vehicles and car trips.

[27] https://www.gov.uk/government/publications/the-ten-point-plan-for-a-green-industrial-revolution/title#point-4-accelerating-the-shift-to-zero-emission-vehicles

[28] https://www.gov.uk/government/publications/clean-air-strategy-2019

[29] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1057375/AD_S.pdf

[30] https://www.englandseconomicheartland.com/our-work/our-strategy/

https://www.englandseconomicheartland.com/our-work/decarbonising-transport/

The investment pipeline identifies Region wide electrification of road infrastructure as a key aim with investment in charging facilities required to support the decarbonisation of the vehicle fleet.

In 22/23 EEH are linking with Transport East and undertaking activities to assist with the coordination and acceleration of the delivery of electric vehicle charging infrastructure. A decarbonisation working group has been set up to share best practice and a standalone roadmap is being developed which will set out pathways to decarbonising transport in the region, including a trajectory and non-binding carbon budgets / targets for transport. Key actions identified are listed in Table 3.2

Table 3.2 – Regional Policies

Policy Document	Selected Actions	Policy Fit
EEH Transport Strategy (February 2021)	The support and planning for decarbonisation of the road fleet, working with the private sector, the energy sector, Local authorities and National Highways to support the delivery of infrastructure required to enable a zero-emission fleet.	Support for decarbonising transport systems.
	Support the deployment of renewable energy generation in the region and opportunities to deploy at scale new technology such as Vehicle to Grid and Hydrogen Electric Vehicles.	Use of regional expertise to develop and improve supporting infrastructure.
	Share experience of the deployment of EV infrastructure in Milton Keynes, Oxfordshire, Cambridgeshire and Peterborough to enable more widespread deployment across the region.	Use of regional expertise to develop and improve supporting infrastructure.
	Work with infrastructure owners and policy makers in the energy sector to ensure that there is the necessary investment in electricity supply and distribution networks.	Ensure additional energy needs can be met.
	Commissioning of a regional EV ownership and chargepoints requirement forecast tool with suggested classification and location.	Provides a cross check for local Hertfordshire based calculations and a model for future deployment site / locations needed to meet demand
	Commissioning of a study to look at how the private sector will invest in public chargepoints in the next 5/10 years.	To help identify the scale of support needed from the public sector to deliver

		equitable access to Chargepoints.

3.3 Local Policies

Hertfordshire County Council declared a climate emergency in July 2019. As set out in the Sustainable Hertfordshire Strategy, the council aims to be carbon neutral in its own operations by 2030, enable the county to have net zero greenhouse gas emissions before 2050, and achieve clean air for all by 2030. The actions in this EV strategy and investment in charging infrastructure will enable the county to deliver against these commitments.

Hertfordshire's Local Transport Plan 4 2018-2031 sets out how transport can help deliver a positive future vision of Hertfordshire.

Within the plan, there is a strong focus on changing travel behaviour, so people choose to travel by non-car modes, to reduce emissions, congestion and improve public health.
Policy 1 in the LTP sets out a transport user hierarchy which states that in the design of any scheme and development of any strategy the council will consider opportunities to reduce the need to travel, then will consider the needs of vulnerable road users (such as pedestrians and cyclists) and the needs of passenger transport users before other motor vehicle user needs.

Whilst conversion of the vehicle fleet to electric propulsion reduces noise and removes tailpipe emissions and therefore contributes to reductions in CO2 and NOx emissions, other pollution remains (e.g. particulates from tyres, brakes and pollution from the vehicle and battery manufacture process). EVs are not carbon neutral with significant levels of embedded carbon remaining in the vehicle manufacturing and potentially energy generation process. Issues such as congestion, speeding and danger from vehicles remain regardless of whether they are electric or petrol / diesel propulsion. The provision of EV infrastructure therefore needs to be carefully considered in relation to its impact on other road users. Residents and businesses should be encouraged to use private EVs for journeys only that cannot be undertaken by walking, cycling and public transport and we should not be developing schemes or strategies which could encourage the greater uptake and use of private vehicles.

Policy 5: Development Management states that the council will ensure any new parking provision in new developments provides facilities for electric charging of vehicles, as well as shared mobility solutions, such as car clubs.

Policy 19 of the LTP on Emissions reduction states that the county council will reduce levels of harmful emissions by:

a) Promoting a change in people's travel behaviour to encourage a modal shift in journeys from cars to walking, cycling and passenger transport.
b) Addressing any barriers to and supporting the uptake of ULEVs in the county, particularly where this can positively affect areas with identified poor air quality.
c) Reducing emissions from its operations.

Table 3.3 summarises relevant policies which support and align with Hertfordshire County Council's ambition for electric vehicles.

Table 3.3 – Summary of selected HCC Policies which support EV

Policy document	Selected actions	Policy fit
Local Transport Plan 4 (2018-2031)[31] (Adopted 2018)	Policy 1 applies a transport user hierarchy which has motor vehicle users at the bottom	We should not be implementing schemes / strategies that could encourage greater uptake or use of motor vehicles.
	Policy 19 states that the county will address barrier to the uptake of ULEVs.	A lack of charging infrastructure is a major barrier to EV uptake.
Sustainable Hertfordshire Strategy[32] (2020)	Includes commitments to move to fuel-efficient and electric vehicles or the council fleet, preparing for EVs by 2030, and achieving clean air for all by 2030.	Leading by example through own operations (council fleet and staff travel) and enabling and inspiring others to act, through promoting uptake of EVs and charging infrastructure.
Air Quality Strategy[33] (March 2019)	Working with partnership, actions identified included reducing emissions from the council fleet, support vehicle free zones around schools and discourage engine idling.	As EVs have zero tailpipe emissions, enabling the transition will reduce pollution from road transport.

3.4 District & Borough strategies and activity to date

Watford Borough Council and Dacorum Borough Council are in the process of developing EV strategies, having taken EV-related papers to their respective governance committees in spring 2022.

As of 1 April 2022[34], four out of our 10 districts and boroughs have taken advantage of OZEV's On-street Residential Chargepoints Scheme (ORCS). Across these applications, nearly £470,000 has been secured in grant funding for Hertfordshire.

[31] https://www.hertfordshire.gov.uk/services/recycling-waste-and-environment/planning-in-hertfordshire/transport-planning/local-transport-plan.aspx
[32] https://www.hertfordshire.gov.uk/microsites/sustainable-hertfordshire/media/sustainable-hertfordshire-strategy-2020-2.7mb.pdf
[33] https://www.hertfordshire.gov.uk/media-library/documents/about-the-council/data-and-information/public-health/air-quality-strategy.pdf
[34] https://www.gov.uk/government/statistics/electric-vehicle-charging-device-grant-scheme-statistics-april-2022

4 Opportunities and challenges associated with EV charging

EV charging presents numerous opportunities and challenges for local authorities, and the UK as whole. Table 4.1 summarises some aspects considered by HCC when developing its EV strategy and the policy positions detailed in the next section.

Table 4.1 – Opportunities and challenges presented by EV charging, from HCC's perspective

Opportunities	Challenges
• Better air quality due to zero exhaust emissions (NOx and particulate matter) • Lower carbon emissions, which will continue to fall with greater generation of renewable energy. This will help to meet HCC sustainability strategy goals and demonstrate leadership.[35] • Cost savings generated by lower running costs[36] of EVs (e.g. fuel, tax, maintenance), for council fleet, businesses and individuals, and favourable salary sacrifice rates for employees. • Local economic benefits from increasing the increasing patronage of local businesses through destination charging and attracting EV drivers as visitors to Hertfordshire.[37] • Increasing demand locally for skilled labour to install and maintain chargepoints (and for EV-trained vehicle technicians).[38] • Investment by chargepoints operators and will stimulate the UK's technology sector and support innovation. • Depending on the contract terms and utilisation of the Chargepoints, Chargepoints may provide a revenue opportunity in the future.	• Other pollutants remain (e.g. particulates from tyres and brakes & the battery & pollutants from the vehicle & battery manufacture process) • Need to ensure that EV provision does not encourage greater uptake & use of private vehicles. • Establishing a comprehensive public network constrained by land availability (e.g. council-owned car parks) and site feasibility (e.g. footway widths) • Available power capacity on the electricity network varies between places and costs of grid upgrades can be very high.[41] • Sites can be constrained by planning or heritage restrictions. • Owning and operating Chargepoints as an authority generates costs and risks. Other commercial arrangements are increasingly possible but the business cases for slower charging can be challenging. • Project and ongoing contract management for Chargepoints can be

[35] https://www.transportenvironment.org/discover/how-clean-are-electric-cars/

[36] Various online tools provide basic estimates, and can be updated with the most recent fuel and electricity prices https://www.fasterevcharge.com/resources/ev-fuel-savings-calculator/

[37] https://www.local.gov.uk/publications/charging-green-recovery

[38] For example, Nottingham City Council has opened Nottingham EV Services, based in one of its depots, to service EVs for the council fleet, local businesses and residents. The existing team have been trained to work on EVs, and an apprentice role has been created. https://www.transportnottingham.com/projects/nottingham-electric-vehicle-services/ IMI Techsafe provides recognised industry qualifications. https://tide.theimi.org.uk/learn/qualifications/electric-vehicle-qualifications

[41] https://innovation.ukpowernetworks.co.uk/facilitating-net-zero/electric-vehicles/

• EVs can be integrated into public transport, car club and taxi fleets and mobility hubs, increasing shared and sustainable travel options. • Widespread smart charging[39] (shifting charging to off-peak times or when renewable generation is high) and in future, Vehicle-to-Grid (discharging electricity back to the grid)[40] will help to mitigate increased peak demand and improve the resilience of the UK grid as the intermittent renewable energy generation increases. • Can use council assets (e.g. car parks) and on-street charging solutions to ensure equitable access to charging, unlocking EV demand. • Central government grant funding to partly cover capital costs is available, and private sector match-funding is increasing.	an additional resource burden for councils and businesses.[42] • On-street chargepoints installations need to be well positioned and designed to meet accessibility best practice and avoid impeding pedestrians and cyclists, in line with HCC's travel hierarchy. • Awareness of EVs and charging infrastructure among businesses and residents can be limited, leading to unrealistic expectations regarding chargepoints provision. • In a fast-evolving sector, local authorities will have to manage the need for chargepoints upgrades and risks of potential technology obsolescence through contracts with suppliers.[43] • As EVs are increasingly adopted by mainstream consumers, charging behaviour may change (e.g. use of 'electric' forecourts, compared to on-street charging). Delivery plans and HCC's strategic direction may need to be revisited to reflect changing needs. • Drivers value consistency across a region in how to use chargepoints (e.g. payment options), but this should be balanced with a need for multiple operators to avoid local monopolies developing.[44] • Parking demand from petrol/diesel vehicle drivers needs to be balanced with demand for dedicated bays for EVs to ensure ready access to chargepoints. Local needs will vary between neighbourhoods and throughout the transition.

[39] Government consultation: https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1015285/electric-vehicle-smart-charging-government-response.pdf
Overview intended for EV drivers: https://blog.evbox.com/uk-en/smart-charging-regulations
[40] https://eandt.theiet.org/content/articles/2022/08/uk-test-of-vehicle-to-grid-system-confirms-ev-batteries-could-balance-the-grid/
[42] https://www.local.gov.uk/publications/scoping-role-local-authorities-EV#capacity-and-capability
[43] https://www.beama.org.uk/static/2945feb3-9dad-450f-baecc95f51bddfb9/BEST-PRACTICE-FOR-FUTURE-PROOFING-ELECTRIC-VEHICLE-INFRASTRUCTURE.pdf
[44] https://www.gov.uk/cma-cases/electric-vehicle-charging-market-study

	• The reliability of chargepoints and limited roaming access (the ability to have one account across multiple networks) remain sector-wide issues for drivers, although there is forthcoming national legislation aiming to improve this.[45]

[1] https://www.gov.uk/government/consultations/the-consumer-experience-at-public-electric-vehicle-chargepoints/the-consumer-experience-at-public-chargep61oints

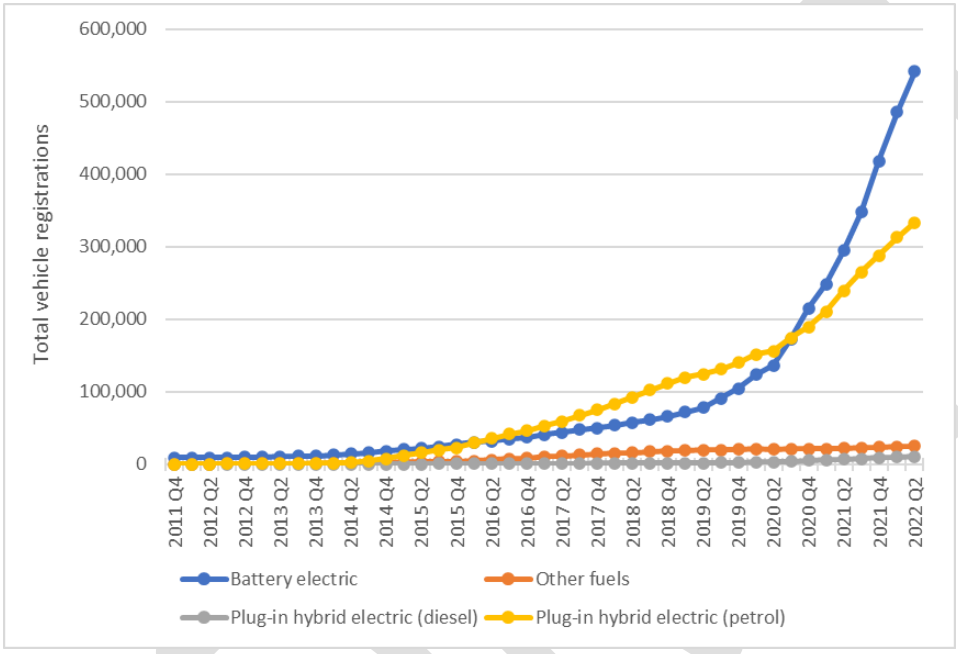
5. EV uptake and chargepoint provision

5.1 National EV uptake

In October 2022, the UK reached the milestone of 1 million EVs registered in the UK, since January 2010. The rate of uptake is accelerating, with a quarter of these EV registrations happening in 2022[46]. EVs now account for approximately 1 in 5 of new cars.

Figure 5.1 shows the rate of uptake for different types of Ultra Low Emission Vehicles in the UK, based on the latest available DfT data[47]. The graph includes all vehicle types (e.g. buses, vans, cars, HGVs) and ownership types (e.g. company and private ownership).

Figure 5.1 Uptake of Ultra Low Emission Vehicles (ULEVs) across the UK.

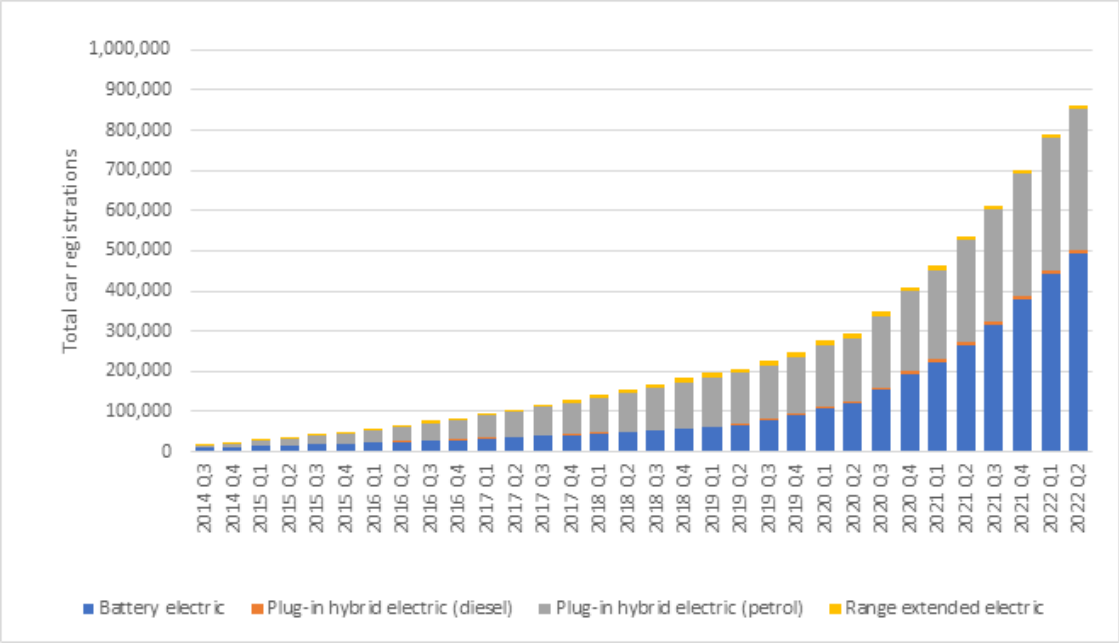


Source: DfT statistics, VEH0132 dataset

[46] https://www.smmt.co.uk/2022/10/new-car-market-up-as-plate-change-september-marks-one-million-ev-milestone/

Figure 5.2 shows the uptake of electric cars alone across the UK, of which battery electric accounted for 57% of registrations

Figure 5.2 Uptake of plug-in cars across the UK (excludes other ultra-low emission fuel and vehicle types)



5.2 Local EV uptake

EV uptake in Hertfordshire has been steadily increasing since January 2010 and accelerating within the last 2-3 years.

There were 6,116 new Battery Electric vehicles registrations in the second quarter of 2022, and a further 4,658 Plug in Hybrid vehicles (petrol and diesel).

Figures 5.3-5.5 show the levels of private EV ownership across Hertfordshire and the variation across the District and Boroughs.

Figure 5.3 EV vehicle registrations in Hertfordshire

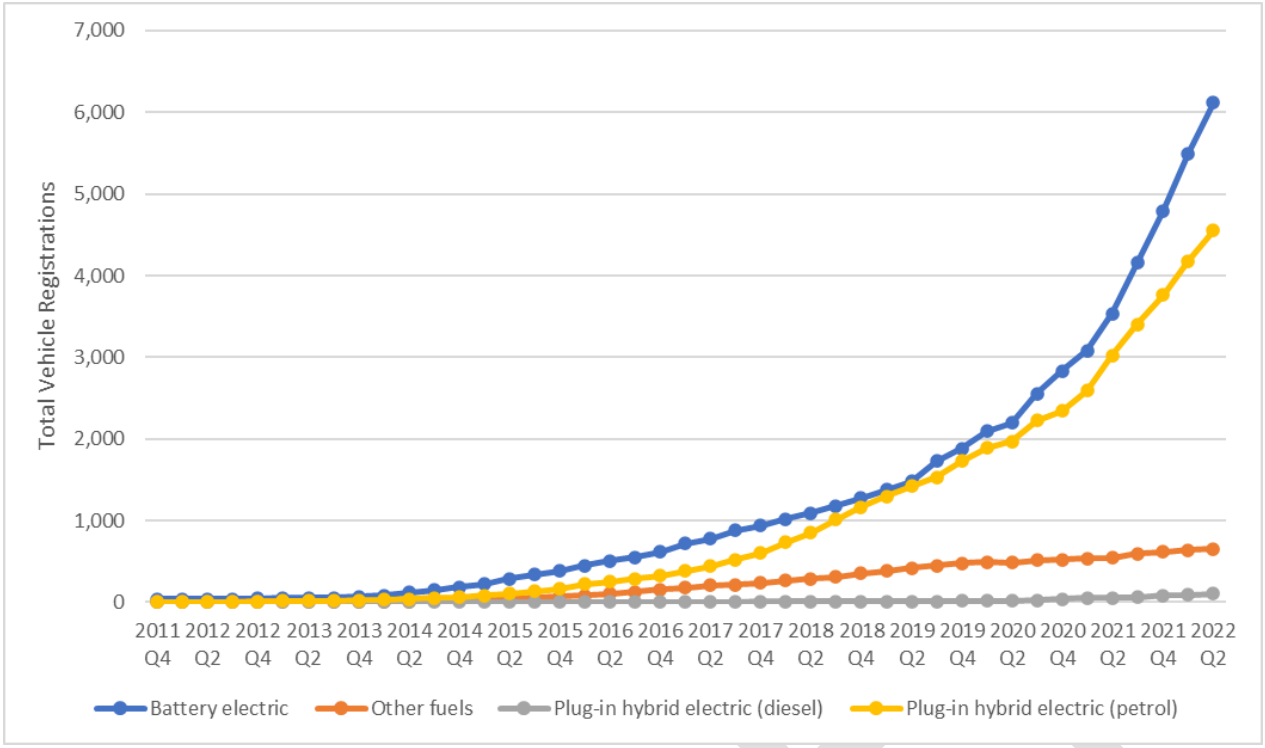


Figure 5.4 Total Battery Electric (BEV) vehicle registrations by district

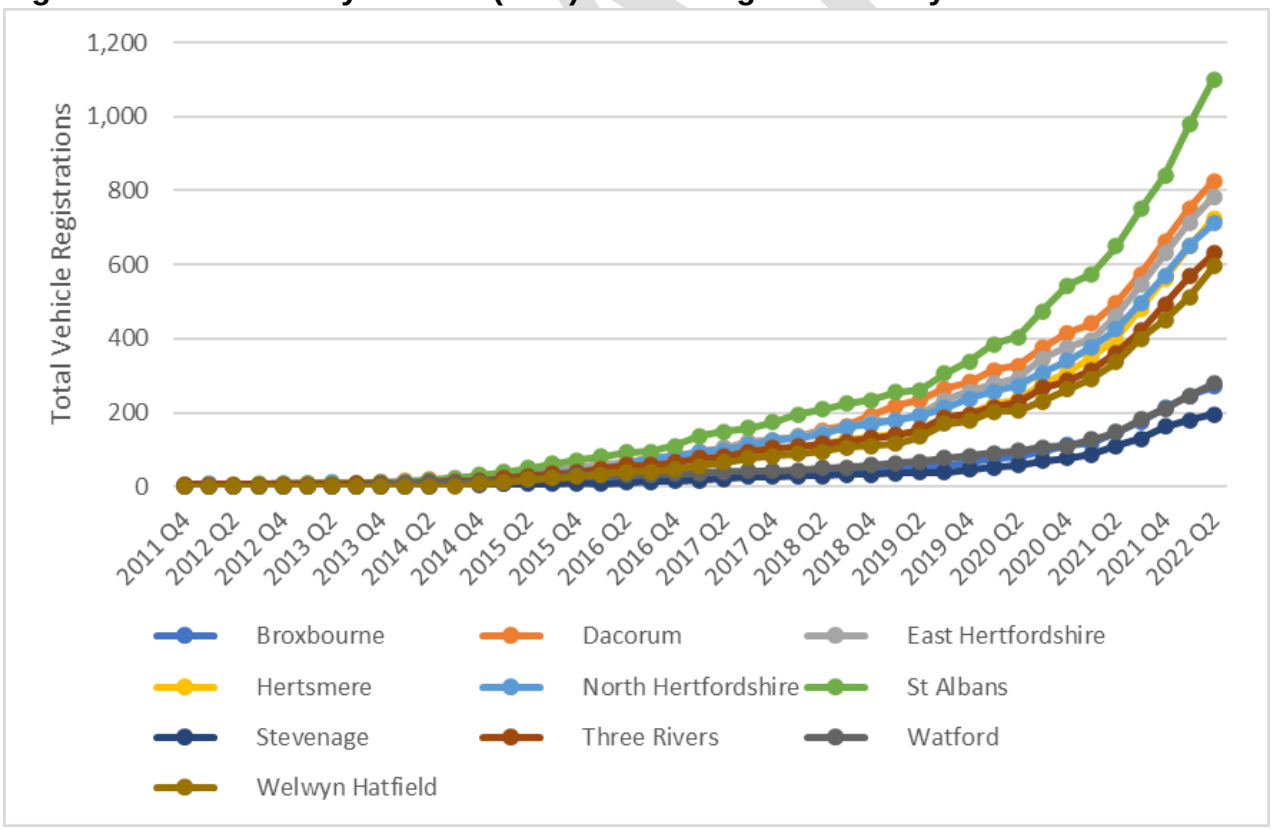
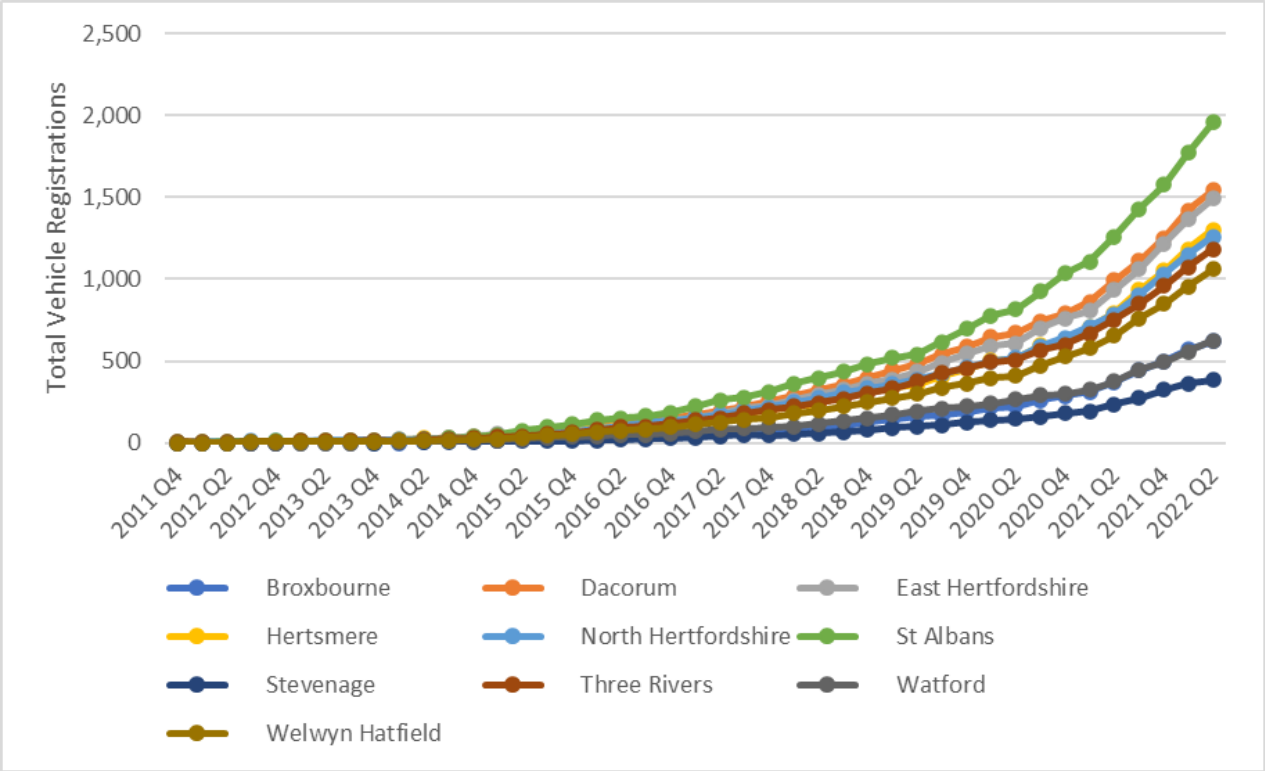


Figure 5.5 Total Low Emission (EV & PHEV) vehicle registrations by district

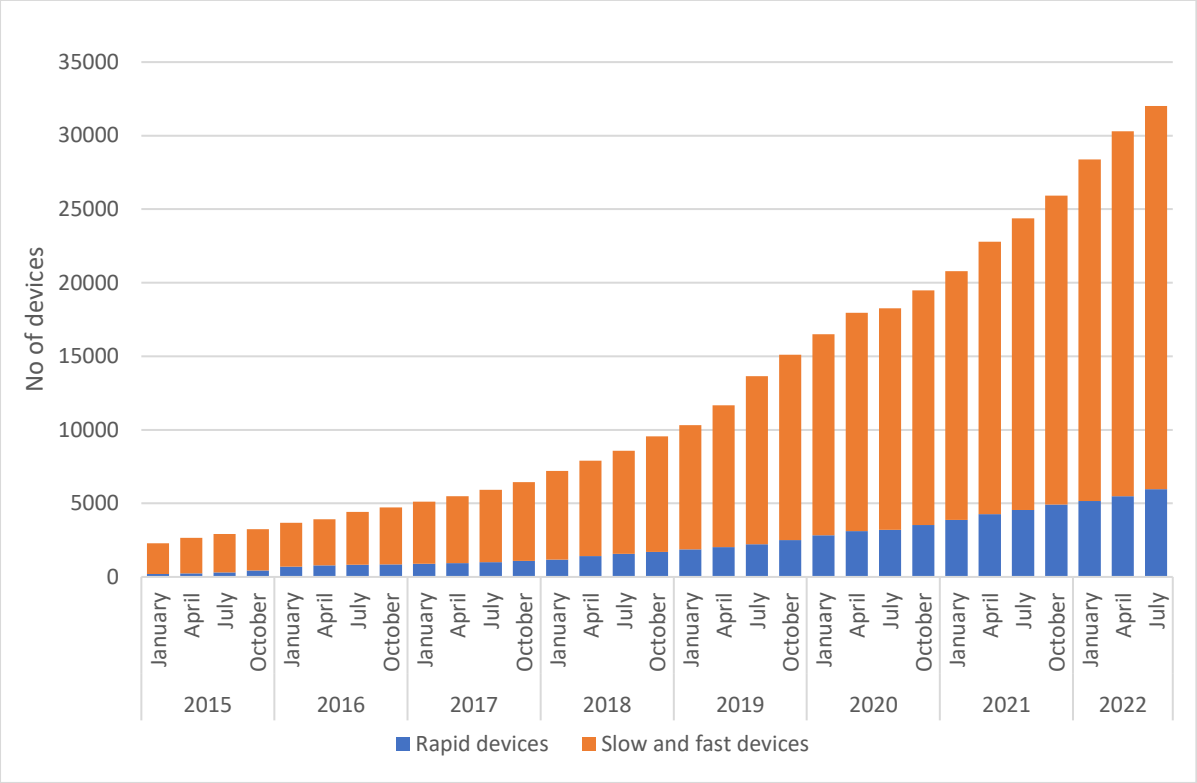


5.3 Current national public chargepoint network

As of July 2022, there were over 32,000 publicly available charging devices across the UK, of which 19% (5974) were rapid (50+ kW), according to DfT (latest available data) [1], see Figure 5.6. This equates to a national average of 47.7 charging devices per 100,000 population.

In addition, since 2014, 328,657 private home charging devices have been installed by households with off-street parking through OZEV's grant schemes, as well as 31,239 workplace devices.[2]

Figure 5.6 Number of chargepoints devices across UK, by type (speed).



Source: DfT Electric vehicle charging device statistics

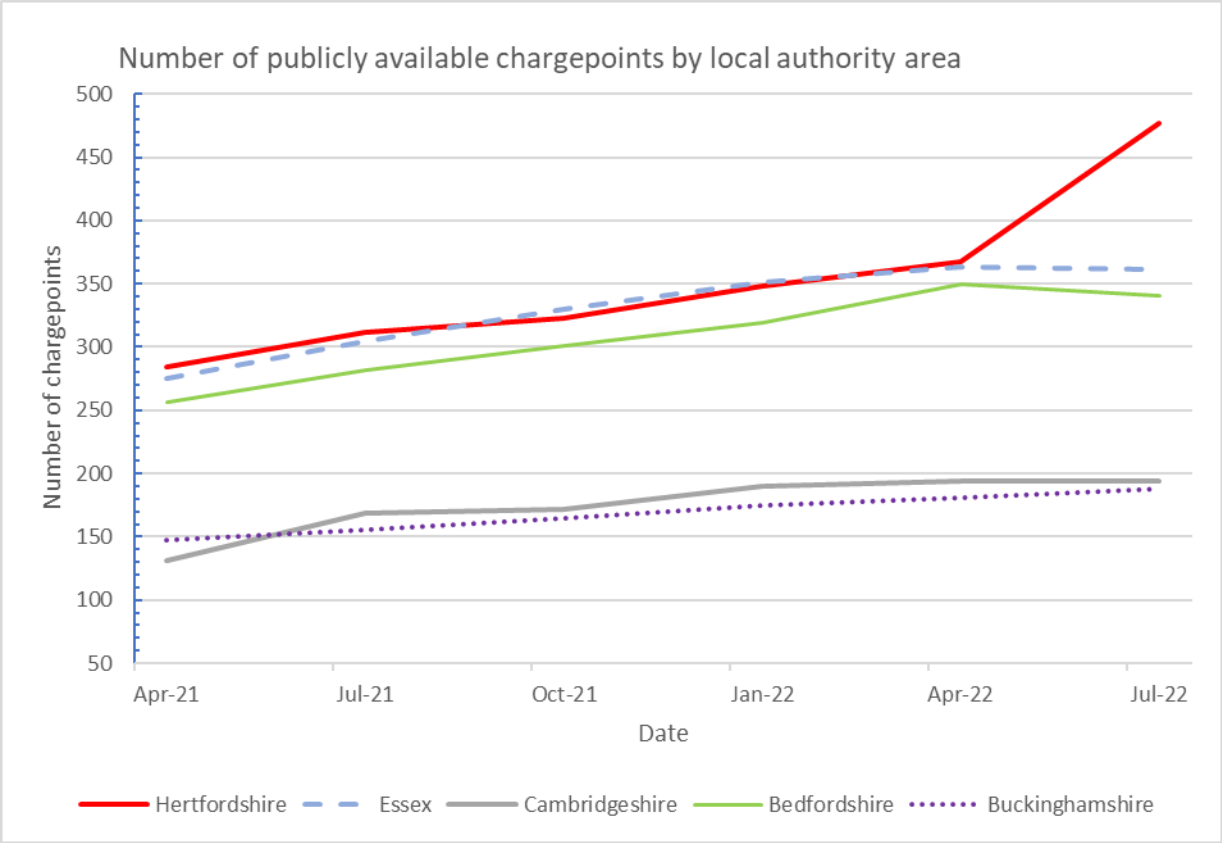
5.4 Current Local public chargepoint network

The latest published data suggest there are currently 477 publicly available chargepoints (including 78 rapid chargepoints) in Hertfordshire. Roll out appears to be accelerating with 110 chargers implemented between April 22 and July 22.

Figure 5.7 below illustrates the recent installation trajectory in Hertfordshire and neighbouring local authority areas.

The proportion of EV ownership in the county is however still low. The County Travel Survey (June 2022) identified that 8% of respondents owned a hybrid vehicle (up from 3.5% in 2018) with 69% saying that their vehicle did not require charging. 3.3% of respondents had a fully electric vehicle (up from 0.7% in 2018).

Figure 5.7 Number of Chargepoints by local authority



Source: https://www.gov.uk/government/statistics/electric-vehicle-charging-device-statistics-july-2022

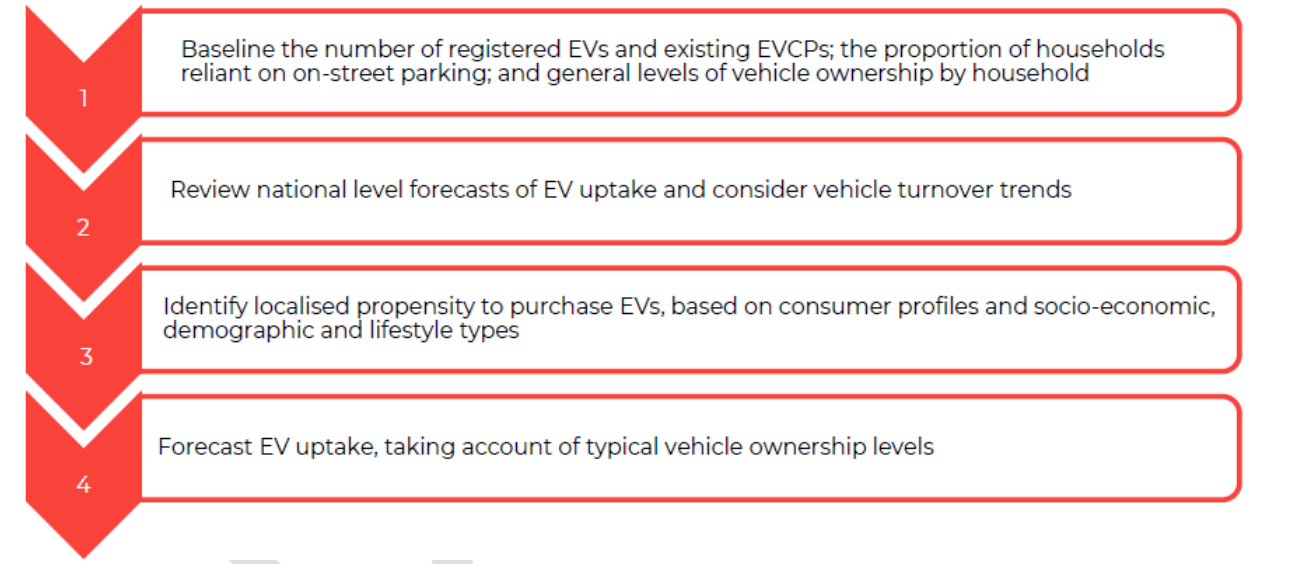
6 Future chargepoint requirements for Hertfordshire

6.1 Forecasts of chargepoint numbers

Although by 2030, the Government will end the sale of new conventional petrol or diesel cars and vans (up to 3.5t), second-hand petrol and diesel cars and vans will still be able to be sold and hybrid cars and vans with "significant zero emission capability" can be sold until 2035. This along with typical vehicle turnover rates, means that the switch to electric is likely to be gradual over time and national forecasting indicates that by 2030 around 30% of vehicles will be electric.

Initial forecasting has been developed by HCC which considers factors such as consumer profiles, socio-demographics, the availability of off-street parking, vehicle ownership, vehicle sales and turnover rates, and vehicle ownership trends. A summary of the forecasting approach is shown in Figure 6.1 below.

Figure 6.1 Hertfordshire Forecasting Approach



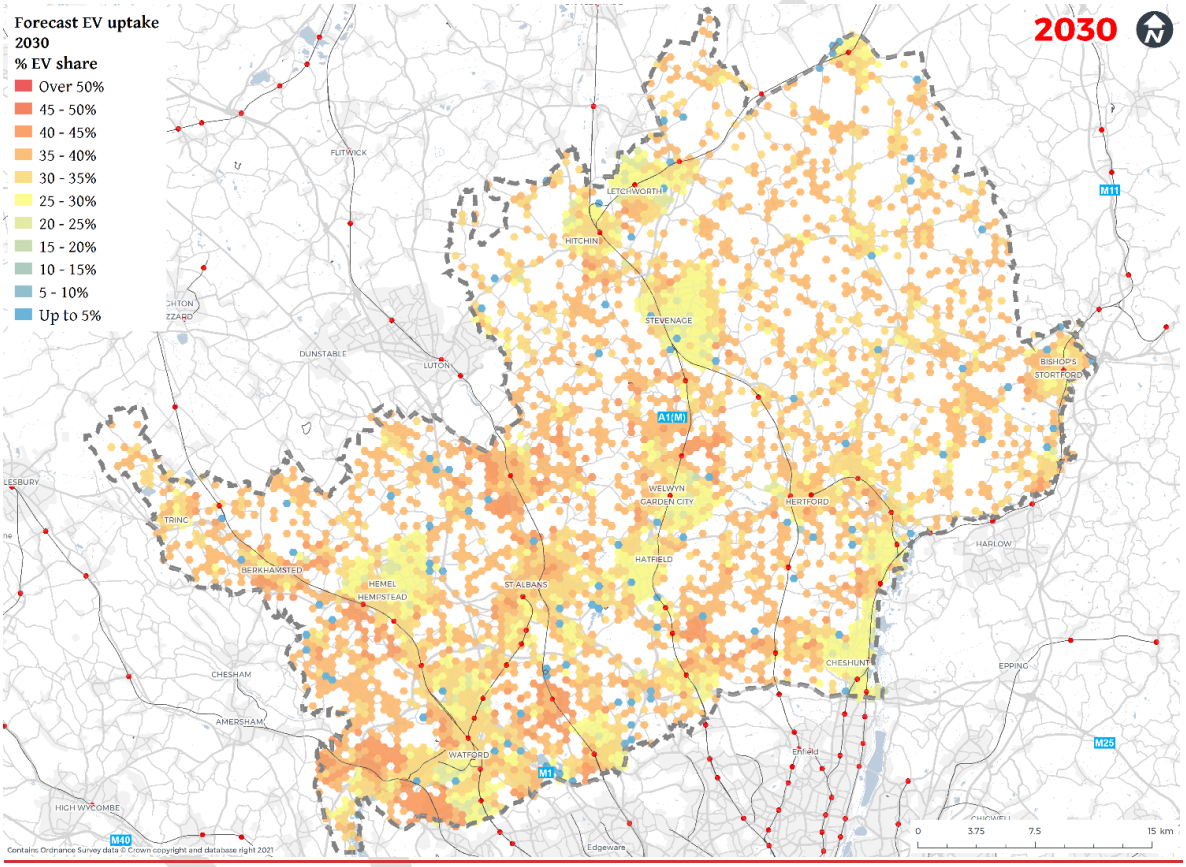
There is a challenge in assessing the future trends in EV charging behaviour due to the current sample size of EV ownership which is still very small in percentage terms as a part of the overall vehicle fleet (3%) and is still dominated by early adopters who are not necessarily reflective of the wider population. It should also be noted that these forecasts were done in early 2022 before the changes in fuel and electricity prices. As such these forecasts will need to be reviewed as part of future updates to the strategy.

The forecasting from early 2022 estimated that by 2030 there would be 240,800 electric vehicles registered in Hertfordshire. It is estimated that this would generate the need for 6,800 publicly available charging sockets (or just over 3,000 chargepoints (Chargepoints tend to have multiple sockets). It should be noted that these estimates are based on current battery technology and driving trends and improved battery range is likely to reduce these requirements.

As previously noted the private market is expected to provide a large proportion of Chargepoints however there is clearly a role for local authorities to help upscale provision particularly in less commercially viable locations.

Figure 6.2 illustrates the forecast EV share across different areas of the county by 2030 and shows a wide variation from areas with less than 5% expected EV share up to those with up to 50% EV share.

Figure 6.2 Forecast EV share in Hertfordshire



6.2 Development of the public charging network

The DfT EV strategy recognises that a significant proportion of chargepoint needs are likely to be met by the private market without additional intervention for example through destination charging or local electric forecourts. The role of the local authorities is therefore to identify where gaps in provision are likely to be and to develop a strategy to fill these gaps rather than leading the provision of chargepoint implementation.

There are a number of actions that can be taken by HCC and the districts and boroughs to fill these gaps. This includes the use of council-owned car parks, publicly owned land assets and highways for chargepoint provision to support residents, particularly those without off-street parking.

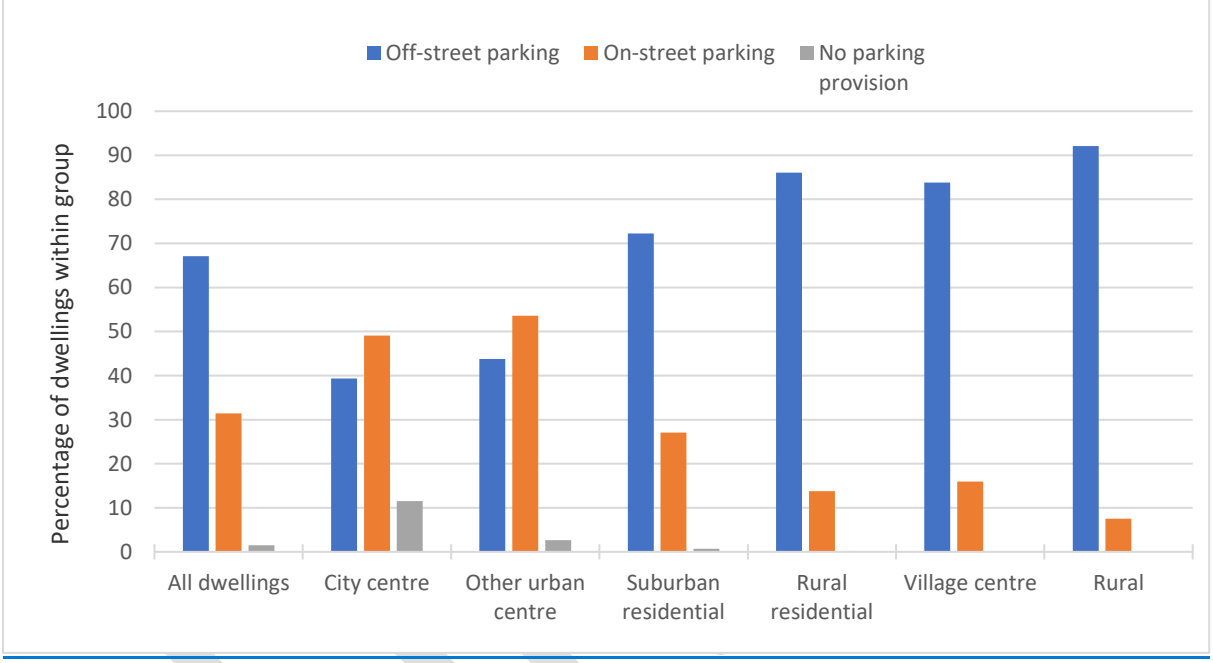
6.3 Charging to support residents

HCC will support the investment in different types of near-to-home charging to enable those without private off-street parking to recharge their vehicles and help unlock uptake for EVs.

Across England, approximately 67% of households have access to off-street parking, such as a garage, driveway or other council or communal private car park, based on data from the English Housing Survey.

Access to off-street parking varies between urban and rural areas. In urban centres, over half of people may not have access to off-street parking compared to less than 15% in rural areas, as seen in Figure 6.3

Figure 6.3 Parking provision by area type, national averages, 2020



In Hertfordshire we have calculated (from our EV mapping work and EV forecasting tool) that 73% of households in the county overall have access to private off street parking facilities such as garages or driveways. As discussed above this proportion will be lower in urban areas, particularly in the more historic towns.

It is important to provide the right type of chargers in the right locations. The duration of charging required in particular locations will influence the type of charger. For example, AC slow and fast chargepoints (up to 22 kW) allow overnight recharging and would be appropriate for on street charging and off street charging hubs close to residential areas. In other locations, where more rapid turnover is required, rapid chargepoints offering quicker charge times are more appropriate. This provision will seek to complement, and not compete with, deployments on private land.

Residential charging has been highlighted by the UK Government[48] and other analysts[49] as a key sector requiring intervention and support. This due to control of the highway and other land assets

[48] OZEV Taking Charge strategy

[49] https://www.cenex.co.uk/case-studies/ev-infrastructure-barriers-and-solutions/

(such as car parks) by local authorities and the more challenging business case for this type of installation linked to the typically lower utilisation rates and higher installation costs.

The most suitable approach and technology will vary between places, depending on factors such as land availability, nearby amenities, pavement widths, grid constraints, and parking pressures.

Without any intervention, there is a risk of residents taking matters into their own hands and trailing cables across footways from their properties. There is also the ongoing issue of inequities in the transition to EVs where people with driveways have advantages over other residents.

6.4 On-street vs off-street charging

Discussions within HCC and experience shared by other local authorities have highlighted various the advantages and disadvantages when installing on-street charging infrastructure, compared to off-street in council car parks. These are summarised in Table 6.1.

Table 6.1 – Advantages and disadvantages of on-street charging

Advantages of on-street installations	Disadvantages of on-street installations
• No behavioural change required by residents used to parking on their street to leaving their vehicle in a nearby car • Reduced safety and security concerns about walking between home and the car park, especially at night and early morning, and leaving a car out-of-sight of home, where may be lower footfall and less natural surveillance • Likely to be more convenient as not required to walk to nearby car park, which may be harder for those with limited mobility, families with young children, or when carrying equipment/luggage. • If the car park is perceived as too far or insecure, there is a risk of residents trailing cables across footways as an alternative, causing a potential trip hazard. • The limited number of council-owned car parks and their uneven distribution across the county may mean there is not a viable alternative for some neighbourhoods. • Retrofitting lampposts with Chargepoints (where feasible) is much cheaper and quicker option than a standalone bollard, either on or off-street, as no new grid connection is required. This would allow greater network coverage to be achieved more quickly.	• Narrow footways and existing street furniture limit the space available for new infrastructure. Access cannot be obstructed for pedestrians and those limited mobility, in line with accessibility standards and HCC's travel hierarchy. • For standalone bollard, installation costs can be higher and take longer compared to off-street locations, due to the civil works required and dispersed nature of the new grid connections, weakening the business case. • Maintenance costs can also be higher, and some authorities have reported higher rates of damage/vandalism. • Until EV uptake increases, on-street installations tend to have lower utilisation rates compared to car parks may be able to serve a larger catchment, weakening the business case. • Depending on the location, Chargepoints may be used by visitors, shoppers or commuters during the day, and residents overnight, increasing utilisation.

	• Dedicating bays for EV recharging-only can increase pressure where there are limited on-street parking spaces (this also applies to car parks but may be less acute, depending on the nature of the location). • Additional equipment can impact the street scene and those without vehicles or EVs may object to additional infrastructure outside their homes. • More public engagement and a more complex process for implementing chargers on street than off street. • Making charging too convenient may encourage a switch to private cars away from other modes (which would be contrary to our LTP transport user hierarchy

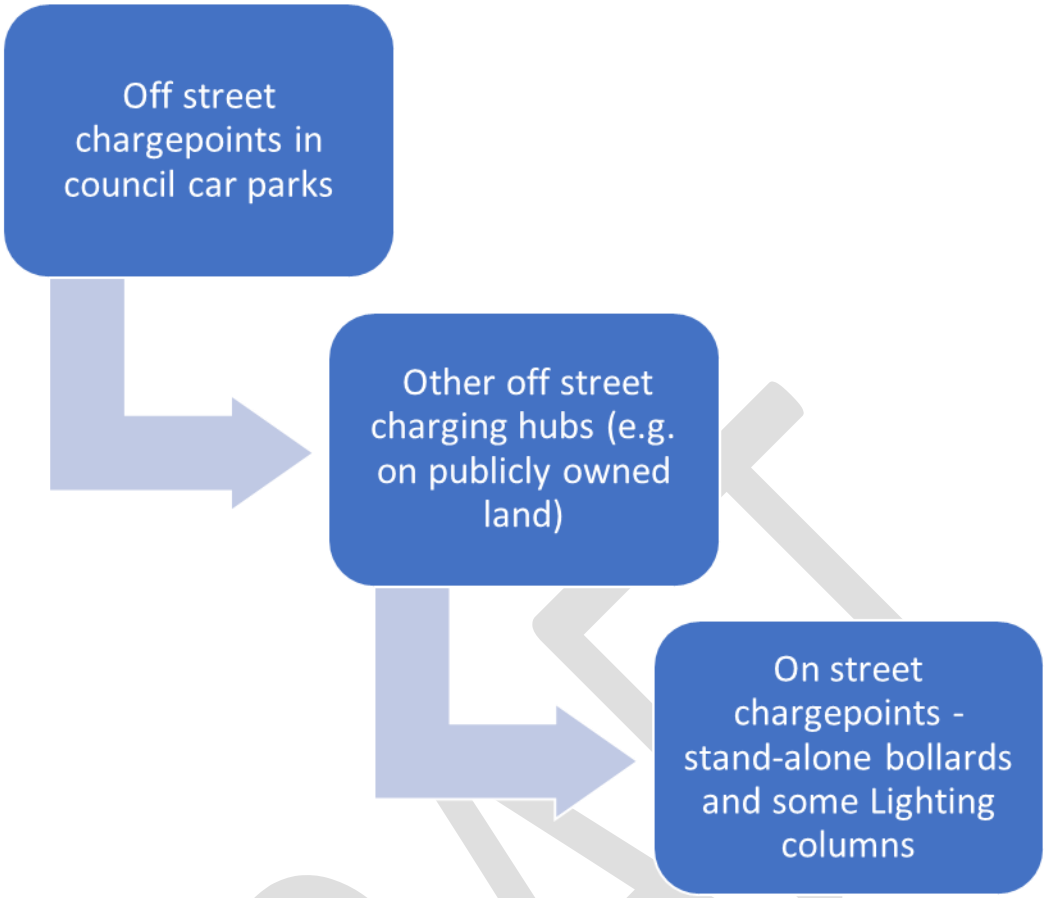
6.5 Residential charging options

Based on the assessment in Table 6.1, HCC have developed a hierarchy of different charging options, summarised in Figure 6.4, to guide priorities when assessing charging options for particular areas.

Where feasible, off-street charging hubs in council-owned car parks should be considered first. There is great potential for this in Hertfordshire with 26,000 parking spaces available in almost 400 publicly available car parks across the county. After this opportunities for chargepoints in other off street locations in the form of hubs on other public-owned land should be investigated. Where neither of these options are possible (e.g. due to a lack of suitable land in the area or areas are away from residential areas) or become insufficient to meet growing demand (e.g. limited car park spaces or long wait times), the potential for on-street installations should be considered.

On street charging options could include standalone bollards or where footway space is limited and where the position and electric supply allows, potential connections to lighting columns. Currently HCC does not allow connections to private electricity supplies and any instances of this will be subject to enforcement action. We are aware of trials elsewhere into gullies and other solutions to allow connections with private supplies and will continue to monitor the outcome of these and will consider whether there is a case to modify our position in future updates of this document.

Figure 6.4 Priority order to assess charging options



HCC are aware that some Districts and Boroughs are inviting requests for on street chargepoints from residents and this is also a common theme in correspondence to HCC. Local authorities do not have the resources to install chargepoints on demand however - where HCC are aware of these requests - we will collate them and add them to our EV mapping tool as evidence of demand. This will enable us to consider request locations against other criteria such as the proportion of residents without driveways, distance from existing chargepoint provision and potential hub or off-street sites.

6.6 Off-street charging in council car parks

The potential location of chargepoints should be considered first in off street public car parks. They offer advantages in terms of generally being accessible and in areas of high footfall making them a more commercially attractive proposition for chargepoint operators. They are also often located close to public services and shops / businesses which can provide an opportunity for people to use them as they go around their daily lives (the destination-based model). There is also the ability to make use of existing assets and enable a concentration of chargepoints in one location. There is also potential for residents without access to driveways to be able to access these car parks for overnight charging where car parks are located close to residential areas.

Typically fast charging is most appropriate in local car parks (particularly in those close to residential areas). However for car parks with high turnover or short stay parking operation rapid charging may be needed (although this will be dependent on-site electrical constraints and funding availability).

There are 25,959 car parking spaces in 384 local authority owned car parks in the county, so this approach offers considerable scope for the provision of chargepoints.

The majority of public car parks are owned and operated on behalf of the District and Borough councils.

HCC will therefore have a **supporting role** and will collaborate with districts to provide the following support where required:

- Guidance on which car parks have the greatest potential to fulfil demand for residential Chargepoints (using the EV mapping tool)
- Sharing of information on electricity grid issues gained from UKPN

Some car parks are also owned by Town and Parish councils, and we will liaise with them to gain a further understanding of the assets available and their appetite to introduce charging infrastructure. We however recognise that there are likely to be particular resource constraints and that there will be a supporting role for HCC in terms of providing advice and guidance.

Some Districts and Borough already have contracts in place with chargepoint operators and have already implemented chargepoints in car parks. The intention is to include for the provision of chargers in car parks as part of the procurement scope giving Districts and Boroughs and potentially town and parish councils the ability to make call offs for this type of charging if they wish. A joint procurement approach including car parks could also help make more marginal sites a more commercially attractive proposition for investment.

It is recognised that there are issues with installing chargepoints in some car parks where residents may be put off from using them by concerns about distance from their homes, security or the cost (if they also need to pay a parking charge). Other types of location therefore also need to be considered to fill gaps in publicly available chargepoint provision and these are outlined below.

6.7 Other off-street charging hubs

There is potential to introduce chargers in other hub locations where there is available public land. HCC have invested in and developed an EV mapping tool that includes additional land holdings, such as HCC assets, UKPN Substations, Parish/Town Council Community Centres, District and Borough assets.

HCC will review the location of publicly owned HCC land assets for their potential (in terms of ability to serve areas of potential high EV charging demand), which are close to residential areas with few private driveways, (particularly in areas away from existing charging infrastructure) and offer easy access due to their location near to the main road network.

Some of these locations are likely to be commercially attractive to the chargepoint operators who are looking for land for charging sites. We will therefore seek to include provision for charging hubs on these types of assets as part of the procurement scope.

6.8 On-street residential charging

Where off street options are unavailable, or numbers of spaces become insufficient to meet growing demand in the area HCC will support the installation of EV on the highway network to fill gaps in provision.

Although we recognise that on street charging infrastructure does have a role to play in filling gaps in EV provision, there are more challenges to providing chargepoints on street compared with off street or hub locations (as outlined in Table 6.3) so the location and siting requires careful consideration. A variety of technological solutions have been developed by operators to try to overcome some of these challenges. This is a rapidly evolving area and Table 6.5 summarises some of the options currently available. We will continue to review technological developments as part of the strategy review process.

Table 6.5 – Overview of on-street technology options

Option	Images	Impact on streets	Complexity of installation and cost	Scalability /acceptability
Post-mounted or free standing bollard	 	High – Chargepoints unit and feeder cabinet can restrict the pavement width. Designs vary in size and height, can be single or dual socket units.	High – requires dedicated DNO connection, and civils works..	Low – Limited by streets with sufficient pavement width and grid capacity. Less commercially viable for chargepoint operators. As lower density, more likely to need dedicated bays.
Lighting column charging	 	Low – integrates unobtrusively into existing street furniture, does not narrow pavement width. If needed, straightforward to remove at end of life, or move to a different location.	Low - Straightforward, quick installation Low cost per unit No new DNO connection required Often have higher density of sockets per street, reducing need for reserved bays.	Low - Limited to areas where lighting columns have sufficient electrical capacity & earthing. Limited to slow charging (up to 5.5 kW, if LED lighting). May be acceptable where lampposts are located at the front of the footway, (satellite bollards can be installed but these are extra cost)

Rising bollards	 	Medium/Low – stored below pavement when not in use, but will narrow footway when in use.	High – Higher costs, deep excavation required, generating complexity with existing utilities. Dedicated DNO connection required.	Low – Limited by streets with sufficient pavement width, grid capacity and underground utilities. Deployed by a very limited number of chargepoint operators/suppliers.
Build-outs (for post-mounted or free-standing bollards)		Medium – Chargepoints unit placed on a build out in the highway, maintaining the pavement width for pedestrians, reinforcing the 'travel hierarchy'.	High – High civil engineering cost. Requires new DNO connection.	Low/Medium – Enables installation on streets with narrower pavements but at significant additional cost (£10k Will result in loss of parking capacity so not suitable for areas with high parking demand.
Lance & socket or similar "low impact" options		Medium/Low – stored below pavement when not in use, but will narrow footway when in use.	High – DNO connection required where deploy several sockets per street as a 'hub'. Innovate UK funded trials underway but not yet fully commercialised, so high cost per unit.	Low - Innovative solution, limited installations to date. Limited by streets with grid capacity. Resident connects their own "lance" to unit, therefore suits regular users. Not currently acceptable in Hertfordshire as connections to private residents supplies on street are not currently permitted.

Districts and boroughs control on street parking within Hertfordshire under local agency agreements and have more detailed knowledge about the characteristics of their local populations and local area including where there are particular parking pressures from residents and therefore are best placed to lead on the implementation and ongoing management of on-street chargepoints. HCC's role will therefore be to **support** this process as follows:

- Identification of areas likely to be suitable for the installation of on street Chargepoints (using our EV mapping tool). This will include information on requests made by members of the public.
- Provision of siting guidelines to guide the installation process within both residential and non-residential areas. These are included as Appendix A.
- Intelligence on what the Chargepoints operator market can offer and advice on suitability of different technological options.
- Procurement support including recommendation of a suitable procurement route and access to it and the investigation of group procurement options for interested authorities.
- Granting of powers to districts to install Chargepoints under the variation to the parking agency agreement (this is already being trialled in Watford and Stevenage).
- Inspection and signoff of equipment installed (through the Network Management team)
- Ad hoc checks of the equipment (through the licencing and enforcement team)
- Provision of category 1 (emergency / make safe repair) service where issues are reported through the Highways Fault Reporting system.
- Support for bids for funding of infrastructure.

Further information on the process and principles for implementing on street chargepoints is given in the next section.

7 On Street chargepoint network delivery principles

7.1 Process for the installation of On Street chargepoints

As previously outlined as Districts and Boroughs control on-street parking within Hertfordshire they are best placed to lead on the implementation and ongoing management of on street chargepoints.

For on street charging where chargepoints are likely to be slower with less turnover of vehicles a combined countywide approach to procurement is likely to be more attractive to the chargepoint operator market and it is suggested that HCC take a lead in this process, identifying a suitable procurement mechanism and drawing up a specification to ensure that the suppliers provide evidence of competency and adhere to the required standards and codes of practice. This will be captured in a service level agreement with the chargepoint operator and built into the procurement process.

Districts and boroughs will be responsible for appointing appropriate chargepoint operators using the agreed procurement approach and managing them to install on street chargepoints in their areas. HCC will use extended parking agency agreements as the basis for enabling this.

HCC as Local Highways Authority have a key support role to help identify suitable locations and set out rules (guidelines) for site installation for the chargepoint operators to follow. The suggested process is outlined in Section 7.2 below.

Once locations for chargepoints have been agreed and the chargepoint operators have detailed implementation specifications, Districts and Boroughs should share the proposals with HCC. HCC will provide a dedicated technical resource to enable this checking, particularly with any lighting column installations to make sure any equipment installed on the Highway is correctly sited.

The onus will then be on the chargepoint operator to ensure the equipment is installed correctly and to the relevant standards.

Districts and boroughs will need to ensure chargepoint operators provide asset information so they can be registered with HCC.

HCC will provide a technical resource through our term contractors to sign off the installed equipment as safe and operational. The level of checks required is expected to change as operators and process become more established.

Ongoing resource will also be provided from HCC to ensure any Category 1 emergency repairs identified through our Highways Fault Reporting service are dealt with and the equipment is made safe. Other repairs however will be the responsibility of the chargepoint operator.

7.2 Identification of suitable areas for on street charging

On street charging infrastructure has an important role to play in filling current gaps in EV provision, meeting future demand and encouraging uptake. However given the complexity of installing in these locations it is important that careful consideration is given to their location.

HCC has developed an EV mapping tool which can be used to help identify areas which may be appropriate and suitable for the installation of on street chargepoints by combining evidence of the following:

- Accessibility to existing chargepoints
- Proportion of properties without access to driveways or private off street parking
- Locations of potential future off street hub or destination charging
- Forecast EV demand (from the EV ready tool)
- Resident requests for chargepoints (where known)
- Available footway widths
- It is recommended that this intelligence is shared with Districts and Boroughs to enable the identification of a long list of potential locations where there is likely to be demand for EV chargepoints but where there is a current lack of provision.

Once these areas / streets have been identified then there is a need to consider the practicality of the physical implementation of chargepoints. There will need to be some flexibility in locations as some may be impractical due to electricity grid constraint issues, commercial considerations or physical site constraints.

Once individual streets are shortlisted the practicalities of the physical installation process need to be considered. To support the rollout of on street charging HCC has developed, in collaboration with local District and Borough Councils, an on-street siting criteria to help guide the installation process.

The full siting guidance can be found in **Appendix A** but is summarised below:

- **General location:** on street chargepoint locations should be targeted towards areas where there are obvious gaps in existing public chargepoint provision, which cannot be adequately addressed by off-street charging

- **Place and movement:** chargepoints must maintain minimum footway widths and required distances from existing on-street furniture (including other chargers) in order to minimise the impact on pedestrians and ensure that those with mobility impairments and buggies are able to pass safely

- **Integration with streetscape:** chargepoint design and placement (e.g. bay layouts) should be sensitively integrated into the streetscape and meet the latest accessibility standards and guidance

- **Parking management:** appropriate parking and enforcement schemes (including exemptions) should be implemented by the local authority based on the charger type, location and parking pressures

- **Planning considerations:** advice should be sought from the relevant planning authority if the proposed location/s identified are within a conversation area, natural green space or within the vicinity of a listed building

- **Power Supply:** all electrical works undertaken must demonstrate compliance with the Code of Practice for Electric Vehicle Charging Installation. This section of the siting criteria also includes information on **current exemptions**, which include:

    - Prohibition of connections from private power supplies across the public highway (including footways).

- Prohibition of cabling from power supplies across the footway by suspension or running cable across the footway itself
- Not allowing adaptive infrastructure, such as gullies and cable protectors (however HCC are monitoring the outcome of several trials)

Once sites have been identified these will need to be finalised in accordance with the siting guidance with agreement from HCC, the local DNO (to ensure no power capacity issues) and in consultation with local residents.

8 Influencing & monitoring the private charging network

8.1 Introduction

The vision for Hertfordshire's charging network is to offer residents and businesses a choice of convenient, affordable options to recharge their vehicles. Some of these chargepoints will be part of private-led deployments and located on privately owned land, such as workplaces and shopping centres, rather than on-street or in council-owned car parks or other assets.

As outlined in Section 1 [Introduction], these installations are more likely offer 'top-up' charging at destinations or high powered en-route charging, rather than slower, typically overnight charging. They are therefore likely to be complementary to any residential charging provision although as shown in Table 1.3 their role is predicted to increase over time due to greater rollout and the emerging trend for top up charging.

8.2 Workplace charging

Workplace chargepoints are expected to grow in number and provide an opportunity to provide access to low cost, long duration charging for those who have a privately-owned EV that are hybrid/office based, and those employees who have an EV as their company vehicle but do not have access to off-street parking

Across the East of England region 3,087 chargepoints have already been installed by organisations with the support of the Government's Workplace charging scheme[50].

Whilst HCC has limited influence over this sector as part of HCC communication strategy, we will continue to publicise the availability of this grant funding and related guidance, such as guidance from DBEIS on Connecting EV chargepoints to the electricity network[51] and from DfT on zero emission fleets.[52].

HCC aims to be carbon neutral in its own operations by 2030, and it is therefore leading by example in the transition the council fleet to electric vehicles.

8.3 Destination charging

Destination charging has an important role to play in a charging network, particularly by offering drivers more choice and is likely to become increasingly important given the emerging behavioural model of top up charging and technology evolution.

Chargepoints are being increasingly installed in supermarkets, retail outlets, leisure facilities, hotels, restaurants, tourist attractions, and privately managed town centre car parks.

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[50] https://www.gov.uk/government/statistics/electric-vehicle-charging-device-grant-scheme-statistics-april-2022

[51] https://www.gov.uk/government/publications/connecting-electric-vehicle-chargepoints-to-the-electricity-network/connecting-electric-vehicle-chargepoints-to-the-electricity-network

[52] https://www.gov.uk/government/publications/zero-emission-fleets-local-authority-toolkit

As well as enabling convenient charging, the visibility of chargepoints at these destinations can raise public confidence in chargepoints availability, even for those who are unlikely to depend on public charging in practice due to having off-street parking at home. This is particularly important as research undertaken by TRL, et al[53]., highlighted that drivers' perception of access to chargepoints often lags behind the actual infrastructure available.

For businesses, having chargepoints can attract visitors and encourage longer dwell times, and several commercial business models are developing.[54] In their recent market study, the CMA reports that the sector is developing well[55] and OZEV does not see destination charging as an area for government intervention, unlike on-street charging and the strategic road network.[56]

Over the coming years, a significant increase is expected in the number of chargepoints being installed on private land at destinations, such as supermarkets and shopping centres, and transport hubs, such as train stations

While there is not a comprehensive national picture of planned installations by the private sector, various reports and recent industry announces provide an indication. For example:

- Nearly 1,000 chargepoints were installed at supermarkets between Jan 2020 and Nov 2021, according to Zap-Map and the RAC. As of Nov 2021, there were 2,059 chargepoints at supermarkets, up 85% from Jan 2020. 8% of all the UK's 26,000 publicly accessible chargepoints are at supermarkets.[57]
- Since 2020, Instavolt has been installing 125 kW chargepoints at McDonalds, and has plans to install at 450 KFC sites and 200 Costa Coffee locations.
- Osprey plans to install 400 rapid chargepoints at 200 Marston's pubs, with the 100th installed in Feb 2021.
- Rail stations – 450 chargepoints were installed by Network Rail in July 2022. Users can make a single payment to cover parking and charging, and some have been installed in disabled bays.

Zap-map[58] provides an up-to-date view on the number and distribution of all publicly-accessible chargepoints across Hertfordshire, including those on private-land.

However, there is currently a lack of centralised information on the planned number and likely location of these chargepoints within Hertfordshire.

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[53] Driving and accelerating the adoption of electric vehicles in the UK – Final report (2020) The Behavioural Insights Team and TRL. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/914111/driving-and-accelerating-the-adoption-of-electric-vehicles-in-the-uk.pdf

[54] https://pod-point.com/guides/business/ev-charging-business-models

[55] https://www.gov.uk/cma-cases/electric-vehicle-charging-market-study

[56] P9 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065576/taking-charge-the-electric-vehicle-infrastructure-strategy.pdf https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065576/taking-charge-the-electric-vehicle-infrastructure-strategy.pdf

[57] https://www.zap-map.com/supermarkets-add-1000-ev-charge-points-since-2020/

[58] https://www.zap-map.com/live/

In Section 6, the forecasted requirements for the number of public chargepoints needed in Hertfordshire by 2030 factor in the extent that charging demand is likely to be met through private sector-led installations, based on national trends, local land uses and potential installation costs (mainly linked to available grid capacity).

Any chargepoints installed by Hertfordshire or district councils will therefore be complementary and additional to this private-led provision, filling gaps in the network and meeting different user needs.

Although HCC's role in this sector is limited it is intended that HCC will continue to gather market intelligence on future deployments in Hertfordshire, and monitor platforms, such as Zap-map, to track the number of chargepoints being delivered by the private sector against the forecasted requirements. If needed, HCC will update its delivery plans accordingly.

This will enable us to keep an up-to-date strategic picture of where gaps in provision lit and at the same time enable us to publish information on the total number of chargepoints available across the county to increase awareness and confidence in the developing charging network.

HCC does not have direct control over installations on private land but will seek opportunities to encourage local businesses and other landowners to install publicly accessible infrastructure where appropriate. For example, this may be through a communications campaign targeting independent businesses and signposting to available guidance.

For new developments, HCC will require chargepoints to be installed at the outset, see Section 10.

8.4 En-route charging (SRN)

Investment into charging at motorway services and along major A roads will be led by the private sector, driven by new government targets and a £950m Rapid Charging Fund for strategic grid upgrades. There is a limited role for HCC to play, apart from monitoring developments, and these installations will primarily serve different users to residential and destination chargepoints.

By the end of 2023, the Government aims to have at least six high powered, open access chargepoints (150 - 350 kW capable) at every motorway service area in England, with some larger sites having as many as 10-12. By 2035, the Government expect around 6,000 high powered chargepoints across England's motorways and major A roads.

The Government's Rapid Charging Fund[59] aims to ensure that there is a rapid-charging network ready to meet the long-term consumer demand for electric vehicle chargepoints. The fund will cover a portion of costs at strategic sites across the strategic road network where upgrading connections to meet future demand for high powered chargepoints is prohibitively expensive. Timing and process for delivering this funding is still to be confirmed, but it is unlikely to be open to local authorities. As it is anticipated that this investment will be led by the private sector.

The Government will also consult on mandating that service area operators and large fuel retailers must have a minimum number of chargepoints at specific sites.

[59] https://www.gov.uk/guidance/rapid-charging-fund

We are aware that rapid chargers are being rolled out at a number of locations in the county including 6 at South Mimms service station.

HCC will continue to monitor announcements related to the Rapid Charging Fund and publicise any new infrastructure once it is operational to raise awareness and confidence in the developing national network.

8.5 Major rapid hubs and forecourts

Private sector investment is also expected by fuel retailers and new market entrants into large rapid/ultra-rapid hubs, which aim to replicate a similar experience to refuelling a petrol or diesel vehicle.

While there is uncertainty over the extent that major hubs and conversion of forecourts to host rapid and ultra-rapid chargepoints will play in meeting demand, investment into this type of charging is unlikely to be sufficient alone, especially given the distribution of suitable land and high volume of EVs expected in the coming decades. UKPN estimates that charging at motorway services and fuel forecourts collectively will account for 8% of charging in 2028.

There is limited information on the extent to which future charging demand may be met by these large, high-powered hubs or forecourt provision, nationally or in Hertfordshire, in the short or long-term. These are major, multi-million-pound developments which will depend in securing land, planning permission, grant funding and significant private investment, and are therefore likely to be more significant for some localities than others.

We are aware that there are proposals for rapid charging hubs at A1m junction 7 and at Stansted Airport.

A few fuel retailers have announced their plans for EV charging at forecourts with the setting of ambitious targets for new chargepoints by 2030.

Examples of chargepoints at fuel retailers in Hertfordshire include the Shell Garage at the Noke on the A405 north of M25 Junction 21a and proposals in Buntingford.

HCC will monitor planning applications and investment by fuel retailers into forecourts across Hertfordshire over the next 5 years to build a better spatial understanding of this type of provision through our EV mapping tool and track against the forecasts of chargepoints requirements.

HCC owns a number of land assets across the county. Where these are highway assets we will investigate the potential for delivery of chargepoints and seek to identify parcels of land (based on their proximity to areas of demand) that may be attractive to the private sector for development into hubs. We will also identify locations in the wider property portfolio where there may be potential for chargepoints and make our Property and Estates team aware of their potential for this use. ….

8.6 Home private charging (private off-street parking)

In April 2022, OZEV replaced the Homecharge grant scheme, which assisted EV drivers with off-street parking to install a private chargepoints, with grants targeting those live in homes with off-street parking but where the installation process (retrofit) and management of chargepoints will be more complex than privately-owned homes.

There are three grant schemes:

- For flat owner-occupiers and renters: Aimed at individuals living in the relevant properties
- For landlords: Aimed at small car parks and single unit dwellings, either residential or commercial (for staff or fleet use)
- For residential car parks: Aimed at multi-unit residential properties or an estate with a common parking area. Covers both active and passive provision.

For all the schemes, there are various restrictions and criteria, such as on the number of applications per year and eligible costs. The grants cover up to 75% of the costs, capped at £350 per chargepoints socket.

Encouraging these groups with off-street parking to install home Chargepoints will help to reduce reliance public charging, allowing greater access for those without an alternative.

HCC's role is limited but we will seek to encourage landlords, those in rented properties and managers of multi-unit residential properties with communal car parks to apply for the available OZEV grant funding by providing information on the HCC website and any relevant communications.

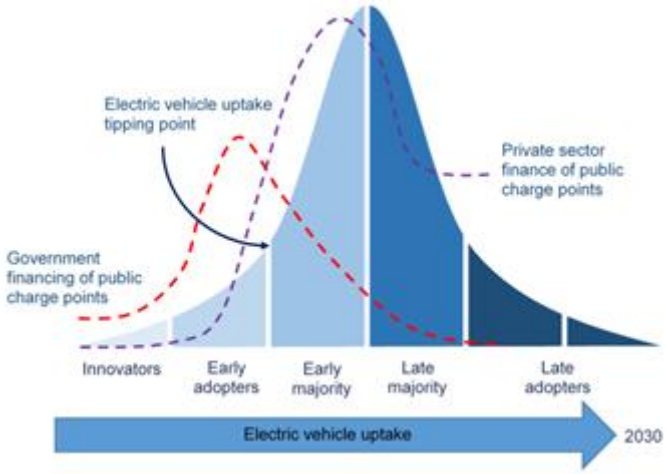
There is also a role for District and Borough councils to make sure that their housing departments are aware of this OZEV grant funding as it may be used for retrofitting social housing properties.

9 Funding & delivery models for public chargepoint network delivery

9.1 Introduction

Ultimately, the Government intends for the majority of the financing for the UK's public chargepoint network to come from private capital, as visualised in Figure 9.1. Reflecting the rapidly maturing EV market, the UK Government's role is beginning to shift from the provision of grants and innovation funding to addressing encouraging a more sustainable commercial model. However, the Government also recognises the importance of continuing funding in some areas to 'de-risk' projects and prove business models, and the crucial facilitation and enabling role of local government.[1]

Figure 9.1 Tipping point from government financing to private sector financing the Chargepoints.



https://www.transport.gov.scot/media/50970/a-network-fit-for-the-future-draft-vision-for-scotland-s-public-electric-vehicle-charging-network-pdf.pdf

Slow residential and destination charging (under 22 kW) continues to be particularly challenging for investors to finance independently. This is due to the limited power that be drawn per day on these chargepoints, slower vehicle turnover, limited opportunities for revenue stacking, users' sensitivity to higher tariffs, lifespan of the hardware and need for upgrades, and resistance to long contract terms (over 15 years) by local authorities.[1]

9.2 Delivery Models

Reflecting the maturity of the chargepoint market, there are a range of delivery models for the rollout of chargepoints, as outlined in Table 9.1.

Nationally, there is a transition underway from 'Own and Operate' to concession agreements for residential charging, however the best approach will continue to vary based on the nature of the project and its commercial viability. 'Own and Operate' may continue to be the best solution where chargepoints are expected to have high installation costs and low utilisation, for example some rural villages, there is central government grant and additional local authority funding available to enable this, or fast installation is the priority.

Concession models which transfer the installation and operational costs to chargepoint operators are likely to be more attractive to the market and leverage a greater proportion of investment where there is a larger, diverse portfolio of sites and a variety of chargepoints.

From HCC's initial discussions and market engagement, there is appetite to seek a concession for a future contract. This is an increasingly common approach, used by Nottingham, Coventry, West Sussex, Kent, Oxford, Devon councils.

Table 9.1 Advantages and disadvantages of various delivery models from the perspective of local authorities

Delivery Model	Potential Control & Income	Potential Risk	Advantages	Disadvantages
Own & Operate All chargepoints costs are paid for by the public sector, with capital and maintenance costs recouped from user tariffs. chargepoints are owned by the public sector, with back-office and operation of chargepoints typically contracted to a private sector CPO for a fixed annual fee.	Highest	Highest	• Highest potential income for the local authority • Full control over locations of installations, tariffs, hardware and software choices, ensuring high quality, equitable provision for residents • Straightforward, quicker procurement process • Easiest to incorporate wider environmental and social value goals • Shorter contracts possible (5-10 years)	• Requires significant central grant funding, often match-funded by the local authority (typically 40%) • Highest risk, in terms of ongoing liabilities, maintenance costs, upgrades, and stranded assets • Revenues dependent on utilisation rates, may not cover costs, especially for <22 kW residential chargepoints • Use of public funds comes with accountability to taxpayer and political risk • CPO has least incentive to repair faults

External Operator Public sector funds the capital investment, but the chargepoint supplier provides a back-office system at no direct cost, in return for a revenue share.	High	High	• Local authority retains most of the revenue generated • Reduced liability for operating costs • Retains high degree of control over chargepoint operations • Shorter contracts possible (5-10 years)	• Requires significant central grant funding to cover all capital costs • Relatively high risk in terms of ongoing liabilities and exposure to varying utilisation rates • Reduced control over the network interoperability of the chargepoints • CPO has least incentive to repair faults
Concession This involves the transfer of operational costs and risks to a chargepoint operator, the concessionaire. The capital costs of the installations may be fully or part-funded by the CPO, and the CPO will cover the costs of operating and maintaining the chargepoints for an agreed period. A profit share agreement will be put in place. The local authority retains ownership of the electricity connection point	Medium	Medium	• CPO provides a share of the upfront capital costs, often as match-funding for a central government grant, rather than the local authority, as well as covering the ongoing costs. • Some income shared by the CPO with the authority, often as a profit or revenue share (the proportion will depend on the	• Reduced income share compared to full ownership • Requires a greater understanding of what the market can offer, and tender process may be more complex than public ownership • Risk that CPOs will not be able to accept the agreement terms, leading to fewer tender responses • Needs to be a relatively large number of sites (>25) so that CPO can balance risk across sites, and long-term contracts (e.g. 10-20 years) • Potential for disputes over responsibility for site failures and expensive termination clauses

			initial public sector investment and profitability of the chargepoints) • CPO incentivised and responsible for maintenance and upgrade of the network, leading to better end-user experience • Reduced risk for public sector in terms of ongoing costs • Depending on agreement, public sector may maintain ownership of the underground electrical connection point. This means there is no lasting obligation to the supplier at the end of concession term.	•

Lease (Fully funded) All capital and ongoing costs are borne by the CPO, with a long-term lease/licence over which the CPO can recover their costs.	Lowest	Lowest	• Lowest risk for the local authority • Rental agreements for parking bays can provide guaranteed income • CPO heavily incentivised to provide good end user experience, maintain and upgrade the chargepoints.	• Lowest potential income • Least control over locations and ability to incorporate wider goals • Likely to involve very long agreement periods and exclusivity agreements • Most likely to suit rapid and ultra-rapid charging in prime locations. Many areas currently unlikely to be commercially viable without public investment, especially slow and fast (<22 kW) chargepoints in residential areas. • Unlikely to retain ownership of the grid connection point, reducing control over the quality of the service and could hinder switching to a different CPO.

[1]https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065576/taking-charge-the-electric-vehicle-infrastructure-strategy.pdf
[2] https://evenergytaskforce.com/reports/encouraging-investment-in-public-ev-charging/
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065576/taking-charge-the-electric-vehicle-infrastructure-strategy.pdf
[1] https://evenergytaskforce.com/reports/encouraging-investment-in-public-ev-charging/

[1] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065576/taking-charge-the-electric-vehicle-infrastructure-strategy.pdf

9.3 Grant Funding

While the private sector is increasingly expected to invest, grant funding may still be needed to unlock delivery at less commercially attractive sites that are expected to have lower utilisation or higher grid connection costs. It is anticipated that HCC and/or district councils will seek grant funding to support any concession agreement for residential charging provision, most likely from OZEV's ORCS or LEVI schemes but recognises that schemes will need to be developed that are commercially viable as funding is unlikely to be ongoing. **Table 9.2** provides an overview of relevant funding sources.

Table 9.2 Example public sector funding schemes and other sources

Funding Sources	Type of charging	Description
On-Street Residential Chargepoint Scheme (ORCS)	On-street or off-street chargepoints, up to 22 KW, in residential areas without off-street parking.	Local authorities can apply for up to 60% of capital costs relating to the procurement and installation of chargepoints, up to a maximum of £7,500 per dual-socket chargepoints, or £13,000 where electrical connection costs are exceptionally high.
Local EV Infrastructure Fund (LEVI)	Chargepoints to support residents without off-street parking.	This £450 million fund aims to facilitate the rollout of innovative, larger-scale chargepoint infrastructure projects, including local rapid hubs and larger on-street schemes. In April 2022, a £10 million pilot was launched.
Innovate UK	Various (local authorities can partner with UK businesses)	Innovate UK offers wide range of funding competitions, some of which can present opportunities to work with businesses to trial or pilot pioneering chargepoint technologies or concepts. For example, in early 2022, £2m was available to develop Vehicle-to-everything (V2X) charging, building on Vehicle-to-Grid (V2G) charging.
Defra Air Quality Grant	Various e.g. dedicated taxi chargepoints	This scheme provides funding to eligible local authorities to help improve air quality. Some local authorities have won funding for chargepoints for taxis and private hire vehicles, for example. It is open for applications for a window each year, with details available on previous winners.
DNO (e.g. Green Recovery Fund)	Various	Specific funding opportunities can periodically arise through the DNOs (e.g. Western Power Distribution), such as the Green Recovery Scheme Call for Evidence in 2021.
Section 106 agreements	Various	Contributions towards public charging provision from new destinations or residential developments could be sought, although this remains relatively rare.

9.4 Considerations for concession agreements

Under a concession agreement, the chargepoint operator will be contributing a significant share of the investment and therefore the scheme proposal must be attractive to market. This can be influenced by the installation costs (e.g. cost of grid connections), revenue potential (e.g. expected utilisation rates, tariffs, profit share), ongoing costs (e.g. back-office costs, maintenance, upgrades) and the contract terms (e.g. contract length, grant funding). Larger, flexible proposals are more likely to be well received by the CPOs.

Typically, concession agreements often last around 15 years, and this can raise concerns. However, through a concession, the CPO is incentivised to minimise 'down-time' and upgrade the hardware and software during the contract as this will encourage good utilisation. Through the procurement process, HCC can require or favour various 'future-proofing' measures, such as NAL sockets, modular Chargepoints designs, passive provision, and seek the latest data communication standards to allow interoperability and roaming between Chargepoints providers.[60] At the end of the contract, the local authority will retain ownership of the most valuable assets, the electrical connection and land, rather than the physical hardware, reducing the risk of redundant assets.

9.5 Community Charging

Community charging can complement the public charging network, filling gaps in provision and increasing choice and flexibility for drivers to help encourage the uptake of EVs and support the electric vehicle charging network.

It may be particularly beneficial in rural areas where the low density of EV drivers without off-street parking can weaken the case for a public chargepoints, or in urban areas where there is a lack of space for on-street chargepoints or a rapid hub.

A growing number of platforms are enabling homeowners with private driveways, known as 'hosts' to rent out their private home chargepoints to other EV drivers, for example to neighbours who lack off-street parking.

Typically, 'hosts' can set the hours the chargepoint is available and the cost to charge, with the platform taking a small percentage. Bookings and payments are managed by the platforms. Co-Charger, Just Park, and Zap-Home are examples.

Parkers[61] summarises the advantages and disadvantages from a host's perspective.

Although rare, there are some community-owned chargepoints in the UK, such as Charge My Street.[62] They are a community benefit society and raise money through community shares,

[60] https://www.beama.org.uk/resourceLibrary/best-practice-for-future-proofing-electric-vehicle-infrastructure-.html
[61] https://www.parkers.co.uk/electric-cars/community-charging/
[62] https://chargemystreet.co.uk/invest

mainly for chargepoints in north-west England. SP Energy Networks offers some guidance on community ownership.[63]

EV car clubs are also initiatives that enable individuals or communities to access an electric vehicle without being tied to ownership

[63] https://www.spenergynetworks.co.uk/pages/community_ev.aspx

10 Chargepoint provision for new developments

10.1 National Legislation

From June 2022, all new homes and buildings (and those undergoing major renovation) in England are required by new building regulations to have chargepoints.

The legislation sets out the following requirements:

- Every new home, including those created from a change of use, with associated parking within the site boundary to have a chargepoint.
- Residential buildings undergoing major renovation, with more than 10 parking spaces, to have at least one chargepoint for each dwelling with associated parking within the site boundary and cable routes in all spaces without chargepoints
- All new non-residential buildings, with more than 10 parking spaces, to have a minimum of one chargepoint, and cable routes for one in five of the total number of spaces.
- All non-residential buildings, undergoing a major renovation, which will have more than 10 parking spaces, to have a minimum of one chargepoint and cable routes for one in five spaces.

10.2 Local Guidance

Hertfordshire's Local Transport Plan which was approved in 2018 and therefore predates the National legislation contains a specific policy on Development Management that states that the county council will work with development promoters and the district and borough councils to:

- Ensure that any new parking provision in new developments provides facilities for electric charging of vehicles, as well as shared mobility solutions such as car clubs and thought should be made for autonomous vehicles in the future.

The draft Hertfordshire Place and Movement Design Guide for developers and scheme designers strengthens this requiring an LTP policy compliance test for strategic developments or transport proposals at the initial gateway stage prior to site master planning.

The Place and Movement Design Guide goes onto recognise that the development of new buildings presents an opportunity to increase the provision of EV charging infrastructure and to future proof associated car parks with electric vehicle charging infrastructure. The design guide states that ultimately this is a decision for the Local Planning Authorities (LPAs) but that HCC will work closely with them to ensure EV charging infrastructure is an integral part of development design. Recognising the EV charging hierarchy, the guide (section 14.10) states that the preference is to enable charging on private drives/ garages or through access to alternative charging facilities in local car parks and rapid EV charging stations and that scheme promoters shall seek a Departure from Standards at the Master Planning Stage if they are considering seeking on-street EV charging facilities.

The Design Guide than sets out the requirements for chargepoints for new developments in line with the new national legislation.

11 Action Plan to enable EV transition

11.1 Introduction

This strategy has identified a number of actions where HCC can work with and support Districts and Boroughs to identify gaps in EV charging infrastructure provision and help accelerate the roll out of publicly available charging infrastructure particularly for residents who don't have access to private off street parking.

This is a new and rapidly evolving sector so the actions identified are short term actions which can be implemented over the next 1-2 years. The intention is to review these on a regular basis.

As an overarching action, HCC will work with district and boroughs to facilitate the development of the public charging network, with a particular focus on supporting households without off-street parking. This investment will complement private sector-led provision and decisions on the type of charging infrastructure provided will be guided by the HCC's residential charging hierarchy.

Table 11.1 to 11.4 below set out a series of high-level actions to be taken within the next 2 years by HCC and districts and boroughs to enable the roll-out public charging infrastructure and influence the development of the private charging network across the region.

Table 11.1 Actions in relation to Off-street charging – in publicly available car parks

Aspect	Suggested HCC support	HCC action	D & B action	Timelines
Location	EV mapping tool	Provide insight on which car parks have the greatest potential to fulfil residential charging demand, if required	Ds & Bs confirm if this support is required	Next 3 months
Power supply	Optimal grid location intelligence	Collate map or summary table highlighting areas with power supply capacity or constraints which may affect installation of rapid or multiple fast chargepoints	Share information on car park characteristics to inform if rapid charging is appropriate	Next 3 months
Procurement	Research on procurement frameworks and approaches	Set up 121 meetings with Ds and Bs undertaking or planning chargepoint procurement if required	Share information on recent procurement activity, lessons learnt, issues	Next 6 months
		Organise procurement workshop with Ds & Bs to agree if should be part of centralised procurement scope in required	Participate in discussions, confirm ongoing needs	Next 6 months

		Collaborate to draft specification	Provide information on previous specifications used & ongoing needs	Next 6 months
		Offer guidance on suitable frameworks, and if needed, support drafting of funding applications		Next 6 months
Installation and operations		Monitor regional activity and progress towards meeting residential charging demand.	Undertake procurement and manage installation process. Ongoing contract management and usage monitoring.	Next 12-18 months, then ongoing management

Table 11.2 Actions in relation to off street charging on Highways land

Aspect	**Suggested HCC support**	**HCC action**	**D & B action**	**Timelines**
Site identification and assessment	Review of HCC highway land assets	Shortlist sites with most potential, including an assessment of most appropriate charging type, feasibility/cost and funding opportunities		Next 3-6 months
Procurement & installation	Research procurement options and develop specification	Identify and include sites in procurement scope		Next 6 months,
	Enabling role	Work with D&Bs to enable installation at identified sites, under licence	Work with HCC to agree delivery approach	Next 6-12 months

Table 11.3 Actions in relation to on street charging

Aspect	Suggested HCC support	HCC action	D & B action	Timelines
Location	Identify suitable areas	Use EV mapping tool to identify long list of potentially suitable locations and provide this information to Ds and Bs	Ds and Bs confirm if location engagement is desired. Share any resident requests or other inputs to EV mapping tool/review process, if required	Next 3 months
	Siting criteria	Finalise on-street siting guidelines, including for lighting columns	Ensure any equipment installed on highways is in line with HCC siting criteria	Next 3 months
Chargepoint Operators (CPO)	Watching brief on EV market	Share CPO research with Ds and Bs	Share any experience from previous procurement or supplier engagement	Next 3-6 months, ongoing
Pre-procurement	Collaborative procurement approach	Arrange procurement workshop with Ds and Bs to define required scope, specification and delivery model	Agree if take a county-wide approach. Collaborate on deciding suitability of shortlisted suppliers. Confirm preferred delivery model	Next 6 months
Legal framework	Vary parking agreements	Legal resource to draft variation to parking agreement (licence 50)	Confirm and agree	Next 6-12 months
Procurement and installation		Support D&Bs throughout procurement, monitor regional activity and progress towards meeting residential charging demand.	Undertake procurement and manage installation process. Ongoing contract management and chargepoint usage monitoring	Next 12-18 months, then ongoing management
Health & Safety	Sign-off for equipment installations	Agree process and secure resource needed. Agree contractor arrangements.	Provide details of installation locations	Establish process in next 6 months, then ongoing
Maintenance	Ad hoc checks of equipment	Agree process and resource	Liaise with CPOs as necessary	Establish process in next 6 months, then ongoing

	Emergency call out (Cat 1 repairs)	Agree process and resource. Ensure covered in specification and contract with CPO.		Establish process in next 6 months, then ongoing
Funding	Understanding resource implications and any funding opportunities, coordination	Review LEVI fund and look at potential for coordinating collaborative application for willing partners. Support ORCS bids by D&Bs if required.	Share LEVI fund bid aspirations/actions	Next 6-12 months

Table 11.4 Actions in relation to the private charging network

Aspect	Suggested HCC support	HCC action	D & B action	Timelines
Workplace charging	Produce or signpost to relevant materials	Publicise the availability of OZEV grant funding and government guidance	Share through communication channels as appropriate	Next 12 months
	Fleet management	Continue to electrify the HCC fleet	Share D&B progress	Underway
Destination charging	Produce or signpost to relevant materials	Publicise the total number of chargepoints available across the county to grow awareness on webpage	Share through own channels as appropriate	Next 12 months
	Watching brief	Gather market intelligence on future deployments, track number of private chargepoints	Share any relevant insights	Next 12-18 months
	Produce or signpost to relevant materials	Encourage businesses and other landowners to install chargepoints though providing information on webpage	Encourage businesses and other landowners to install chargepoints	Next 12-18 months
En-route charging	Produce or signpost to relevant materials	Monitor the Rapid Charging Fund. Publicise to residents and fleets any new infrastructure in county via webpage	Share through communication channels as appropriate	Next 12-18 months
Major rapid hubs and forecourts	Watching brief on market	Monitor planning applications and investment in region	Share any relevant information	Next 12-24 months
Home private charging (private	Produce or signpost to relevant materials	Provide information on webpage to encourage landlords, those in rented properties and managers of multi-unit residential	Work with housing teams to encourage landlords, those in rented properties and managers of	Next 12-18 months

off-street parking)		properties to apply for grant funding	multi-unit residential properties to apply for grant funding Share through communication channels as appropriate	
	Share research	Ensure D&Bs aware of grant funding for retrofitting social housing	Make housing teams aware of funding opportunities.	Next 12 months

12 Setting Targets & Performance metrics for HCC

12.1 Introduction

HCC developed a set of initial EV forecasts in Oct 2021 based on the predicted levels of EV uptake. Based on these estimates, a range of Low, Mid and High numbers of EV charging sockets needed were determined based on the information available at the time as set out in Table 12.1

Table 12.1 Estimated number of Chargepoint sockets.

Forecast EVCP Provision	**Baseline (Oct 2021)***	**2025**	**2030**
Lower EVCP Provision	323	1,514	3,359
Mid-range EVCP Provision		**2,665**	**6,769**
Higher EVCP Provision		3,932	11,774

The high and low scenarios were based largely on the anticipated volume of rapid chargers (requiring fewer overall chargepoints) vs the number of slow chargers (required more overall chargepoints). The mid-range estimate assumes a more balanced level of provision and so is regarded as the more likely.

HCC will adhere to the actions identified in the action plan to monitor the rollout of EV infrastructure, identify gaps in provision and help the upscaling of EV chargepoint provision to work towards the identified targets. However, the global EV market is fast changing with multiple factors have the potential to impact, such as advances in new technologies and battery capacity which could greatly increase vehicle range. This trend, coupled with issues such as rising energy costs and global supply issues, could impact the transition to EVs. As a result, HCC will regularly review these targets to ensure appropriate levels of provision.

12.1 Monitoring

HCC will monitor the uptake of EVs across the region, drawing on data published quarterly by DfT. We will benchmark against national averages to track the pace of the transition and compare to the initial forecasts to check alignment.

HCC will also monitor the number of chargepoints per 100,000 population, in comparison to neighbouring authorities and areas with similar characteristics e.g. availability of off-street parking, pace of EV uptake).

Short term targets (0-2 years)

- Continue to support Districts to expand off street provision
- Support Districts to enable the rollout of on street provision
- Identify assets/land within the County that would be utilised for future EV provision (such as Parish Council assets, HCC assets etc.)

- Lead on a Countywide EV proposal for on street charging and potentially off street hub and car parking charging in collaboration with D&Bs
- Help increase awareness and knowledge of EV capabilities to help encourage uptake
- Closely monitor private ownership and company (i.e. fleets) uptake of EVs both within Hertfordshire and neighbouring authorities to help inform future estimates and ensure accurate levels of EV provision – critical to determine the local number of EVCPs that need to be provided by local authorities

Medium targets (2-5 years)
Current forecasting for HCC estimates that there will be 63,800 EVs registered by 2025 which will require an estimated **2,600 publicly accessible EVCPs.**

HCC will continue with Districts and Boroughs to work towards this target but will closely monitor the EV market, levels of uptake, chargepoint usage and commercial provision to determine the level of local authority-led chargepoints which are required.

Long term targets (5+ years)

Current forecasting for HCC estimates that there will be 240,800 EVs registered by 2025 which will require an estimated **6,800 publicly accessible EVCPs.**

HCC will continue with Districts and Boroughs to work towards this target but will closely monitor the EV market, levels of uptake, chargepoint usage and commercial provision to determine the level of local authority chargepoints which are required.

Appendix A: On Street Siting Criteria

Appendix A: On street charging potential rules and criteria

Criteria	Suggested Rule
General location	On street charging provision should be targeted towards areas where there are obvious gaps in existing public chargepoint provision and there is evidence of a need and/or potential demand for on-street charging.
	Chargepoints should not obstruct pavements or highways or present a safety risk to pedestrians.
	On-street chargepoints will only be considered where there is reliance on on-street parking and limited alternative off-street public or private charging provision.
	On-street charging is very unlikely to be considered in areas close to a council-owned car parks suitable for chargepoint installations, unless there are specific circumstances, such as disability which would preclude an individual from accessing a nearby off-street hub.
	The need for public-sector led provision of on-street chargepoints in areas close to publicly accessible chargepoint installations by the private sector on non-council land (e.g. supermarkets) will be considered on a case-by-case basis, for example, due to site opening hours or chargepoint tariff rates.
Proximity to other chargers	No new on street electric vehicle chargepoints should be provided if public chargepoints in the vicinity (e.g. approx 5 mins walk) are available and underutilised. Additional chargepoints may be added in locations where there is evidence of strong demand (high utilisation or high propensity of EV uptake), on a case by case basis. Where appropriate, new chargepoints may be installed in clusters (i.e. several sockets per street) and/or with passive provision to allow additional chargepoints to be added with minimal disruption and cost.
Management of electric vehicle parking bays.	On Street charging points for individual residents will not be provided (with possible exemption to rule for blue badge holders with dedicated spaces)
	It is expected that any electric vehicle parking bays to be provided on street will be adequately managed as part of a parking management plan/scheme for the area. This may include, but not be limited to, enforcement of restrictions and parking charges. District and Borough Councils will have flexibility to decide whether or not an EV-only TRO is introduced at the outset or only once EV uptake increases. A case-by-case decision based on the local parking pressures and charging technology e.g. lamppost vs bollard, density of chargepoints is recommended.

<table>
<tr><td></td><td>Where there are time-limited parking restrictions on-street, time restrictions on the electric vehicle charging bay will need to match these restrictions.

The type of charging point to be provided will need to match any time-limited parking restrictions. For example, if there is a one-hour parking restriction, a rapid charging point will be the most practical solution. Slow and fast charging points (3-22kW) will be more appropriate serving residents, including overnight charging.

<table>
<tr><th>Charging type</th><th>Speed</th><th>Charge time</th><th>Use case example</th></tr>
<tr><td>Slow</td><td>3kW – 6kW</td><td>6-12 hours</td><td>Residential/workplace</td></tr>
<tr><td>Fast</td><td>7kW – 22kW</td><td>3-4 hours</td><td>Residential / Destination charging (long-stay)</td></tr>
<tr><td>Rapid</td><td>43kW – 50kW</td><td>30-40 minutes</td><td>Destination (short stay) / on-route charging</td></tr>
<tr><td>Ultra-rapid</td><td>100kW – 350kW</td><td>15-25 minutes</td><td>On route charging</td></tr>
</table>

Where a street or area is subject to parking restrictions that favour residents, for example residents parking permits, consideration should be given as to whether the electric vehicle charging bay should be exempt from such restrictions.

In certain instances, such as with rapid chargepoints, it is suggested that a time-limited parking restriction should be introduced on the electric vehicle charging bay. This will help to improve the turnover of parking spaces.</td></tr>
<tr><td></td><td>Free standing chargepoint bollards may be dual or single socket. This will determine the number of any dedicated parking bays.</td></tr>
<tr><td>Planning considerations</td><td>On Street charging should be prioritised in areas close to an Air Quality Management Areas (AQMA).</td></tr>
<tr><td></td><td>Where the need for an electric vehicle charging point is identified in a conservation area, natural green space or within the vicinity of a Listed Building, the local planning authority will need to agree whether planning permission is required or whether this comes under permitted development rights.</td></tr>
</table>

Maintaining a minimum footway	Footways and footpaths should be as wide as is practicable in order to minimise the impact on pedestrians and street character and ensure that those with mobility impairments and buggys are able to pass safely. If installing a chargepoints on the pavement then maintaining an effective footway width of 2.6 metres is recommended, including any additional street furniture (e.g. charging posts and cabinets) that may be required to install the charging point safely. In areas of high footfall (eg in town centres or outside schools) the acceptable width of a footway is 3m. If this is not feasible due to physical constraints, then a minimum effective width of 1.5 metres must be maintained at all times. If this is not possible options such as chargepoints being located on build outs will need to be investigated. Where existing footway widths are less than 1.5m the installation of new chargepoint equipment on the footway which would further constrain its width is not appropriate.
Power Supply	We do not currently allow connections from private power supplies across the public highway (including footways). Cabling from power supplies will not be permitted across the footway by suspension or running cable across the footway itself. We are aware of trials of adaptive infrastructure such as gullies and cable protectors and are monitoring the outcome of these.
	All electrical works undertaken must demonstrate how it is compliant with the Code of Practice for Electric Vehicle Charging Installation. This includes regulations on the distance from pre-existing electrical equipment.
	Where new feeder cabinets are required, their location must be agreed with Hertfordshire County Council. Location of new feeder cabinets must maintain at least a minimum footway width of 1.5m and not obstruct sightlines.

	Any proposals for electric vehicle charging points to be connected to street lights would need to be discussed with and approved by Hertfordshire County Council. It should be noted that the electrical capacity of the current street lighting network is circa 5kW which would only be appropriate for slow/residential charging. Charging from street lights will be considered in the following circumstances: • Where the column is located on the kerbside (and not at the back of the footway) • Where existing footway widths are constrained (ie less than 1.5m) • Where there are limited opportunities to install new electrical equipment such as charging columns because of power supply issues or proximity to other electrical equipment.
Integration into street scape	Chargepoint design and placement (e.g. bay layouts) should meet accessibility standards and guidance
	Chargepoints should be sensitively integrated into the street scape. For example, the visual impact may be minimised through the design of the hardware (e.g. materials, screen size, lighting) and/or the placement of the unit in the street, where feasible, e.g. at the gable end of houses or alongside a hedge or fence, not outside a front door.
	Chargepoint siting should avoid if possible the need for removal of trees or other green infrastructure such as hedges. If this can't be avoided then opportunities for replacement elsewhere should be identified.
	Residents should be consulted, regarding the placement of chargepoints and any changes to parking restrictions.
Finalising sites	Chargepoint locations should be finalised in partnership with the Distribution Network Operator (DNO) and appointed chargepoint operator to ensure technical feasibility, commercial viability for the concessionaire and value for money for the government and taxpayer (e.g. to reduce grid connection and upgrade costs, where appliable).

Hertfordshire County Council
County Hall
Pegs Lane, Hertford
Hertfordshire SQ13 8DQ
United Kingdom

t: +44 1992 555 555
w: www.hertsdirect.org