

Electric Vehicle Infrastructure Strategy 2023-2030 Draft

Executive Summary

The following strategy explores the implementation of electric vehicle charging infrastructure within Spelthorne. This has been developed in response to the climate change strategy (2022) which outlined a key action to further improve EV infrastructure throughout the borough and develop an EV infrastructure strategy. Additionally, residents and businesses will be able to transition to EVs without the fear of not being able to charge them, therefore not hindering their life or business.

Our strategic objectives are to:

- Reduce greenhouse gas emissions from transportation.
- Improve the air quality through reducing harmful pollutants attributed to internal combustion vehicles, nitrous oxide, and particulate matter.
- Adhere to SBCs climate change strategy and respond to the climate emergency.
- Generate a sustainable income stream to enable the council to meet its service needs and invest in green initiatives.
- Utilise Spelthorne's unique location in relation to key national transport infrastructure to provide charging facilities for use of the users of this infrastructure.
- Develop local EV infrastructure to support residents and businesses.
- Ensure sufficient power is available in the local grid for EV infrastructure development.

The target audience for this strategy is:

- Our residents, visitors, and businesses.

There are government targets at both national and local level that encourage the uptake of EVs as a means of climate change mitigation and to improve air quality in urban environments. This strategy builds upon these ambitions, outlining how Spelthorne Borough Council will facilitate electric vehicle charging infrastructure within Spelthorne.

Introduction

The predominant vehicle type in Spelthorne is currently petrol and diesel cars and vans. However, the recent increasing popularity of electric vehicles (EVs) coupled with the upcoming ban of sale of new petrol and diesel cars and vans

by 2030 has meant that there is a strong case for furthering EV infrastructure within Spelthorne.

Emissions attributed to the use of petrol and diesel cars contribute to harmful pollutants that impact public health. Electric vehicles produce zero emissions from the point of use, and therefore carry significantly lower environmental impacts over their lifecycle than petrol and diesel alternatives.

Spelthorne Borough Council (SBC) declared a climate emergency in 2020. Additionally, the transport sector is the largest carbon emitting sector in the UK economy. Therefore, any action that can be taken towards mitigating climate change contributions within this sector should be considered and prepared for by governments at all levels, including SBC.

Surrey County Council and Mayor of London both have targets relating to EV infrastructure. This, in addition to the location of Spelthorne in relation to key transportation infrastructure around London and the number of London commuters, makes it an ideal place for EV charging infrastructure.

Specific to Spelthorne's location relative to London, the ULEZ expansion may further increase the ownership of "Plug-in-hybrid" and electric vehicles for commuters into London.

Spelthorne is uniquely located in that the M25, M3 and Heathrow are all either within, or border the borough. This transport infrastructure services millions of cars yearly. Therefore, Spelthorne can utilise this location to provide EV charging facilities to meet the needs of EV owners that are dependent on this infrastructure.

As vehicle manufactures ramp up production of EVs, there is increasing pressure from both government and manufacturers to further develop EV infrastructure. The UK government is indicating that this is to be led by local governments alongside private organisations. Therefore, this demonstrates the requirement for a comprehensive EV infrastructure strategy.

Policy Context

National policy.

The Government's aim for all new cars and vans to have zero emissions is set out in The UK's Road to Zero Strategy. Under this strategy, the end of the sale of new cars and vans that are not zero emission was set for 2040. However, this was updated in November 2020 with the publication of the Government's Electric Vehicle Infrastructure Strategy. This set out the vision and action plan for electric vehicle provision ahead of the new date of the ban on new petrol and diesel cars and vans forward to 2030. With the sale of new hybrid cars and vans set to be banned in 2035.

It is expected that this transition will be consumer led and will be supported by measures set out in this strategy.

Spelthorne is an air quality monitoring zone, so any action to improve air quality must be considered as a significant factor.

Regional policy

Surrey County Council (SCC) declared a climate emergency in 2019 and set a target of meeting zero carbon emissions by 2050.

Surrey Climate Change Strategy outlines a joint framework for collaborative action across Surrey. This included 8 chapters, of which transport is listed as a key target aiming for a 60% reduction in emissions by 2035 against current “business as usual”.

The Surrey County Council Air Quality Strategy outlines the importance of reducing emissions across the county, incorporating all districts and boroughs to work in partnership to reduce emissions from transport.

The Surrey EV strategy was adopted in 2019 as part of the Surrey transport plan. The strategy details the requirement to, and methods of encouragement for, the transition to electric vehicles within Surrey, including local authority partners such as SBC in the provision EV charging infrastructure.

Local policy

SBC declared a climate emergency in 2020 and adopted its Climate Change Strategy in 2022. Key action 22 of this strategy is intended to improve EV infrastructure throughout the borough and develop an EV infrastructure strategy.

Aims and Objectives

The aim of this strategy is to:

Develop a borough wide methodology to enable the transition to electric vehicles as part of SBC’s commitment to addressing the climate emergency. Ensuring sustainable transport for residents and travellers in the future.

To achieve this, the SBC has set the following objectives:

As a local authority and employer:

- Utilise EV infrastructure for staff uses and through electrification of the council operated fleet.

As a licencing authority:

- To engage, inform and encourage Spelthorne taxi drivers to switch to electric vehicles.
- Working with SCC to identify areas to install on street EV chargers for taxi drivers, businesses, and residents.

Acting in accordance with building regulations:

- As of the 15th of June 2022, new homes and buildings in England are required to have EV charging points fitted.

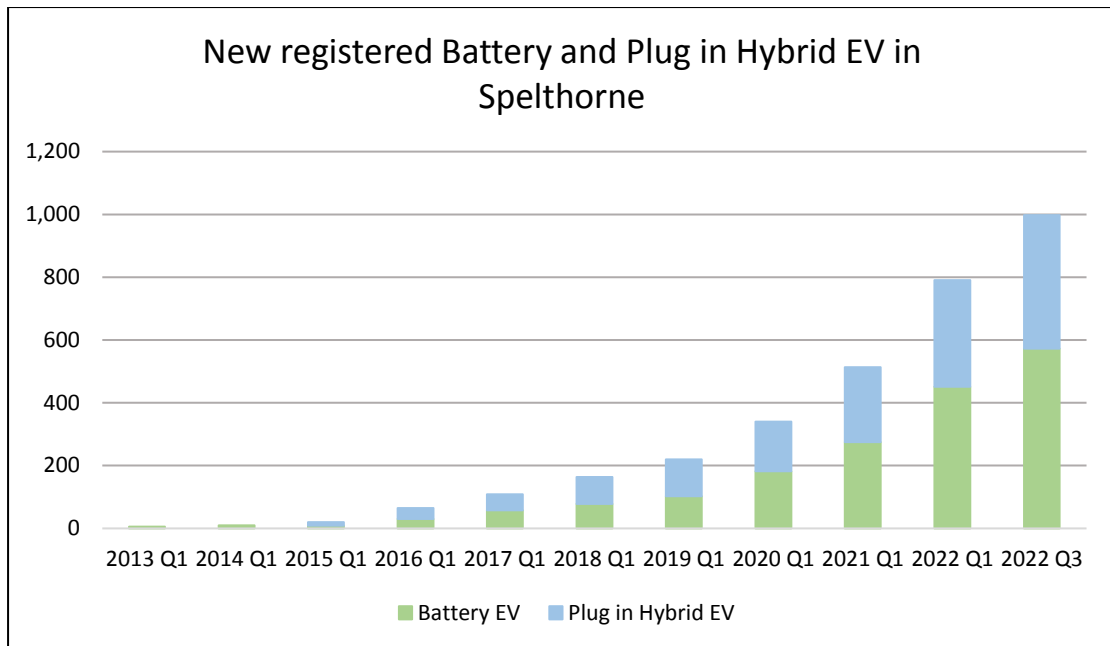
Acting as a landowner, car park operator and landlord:

- Encourage the uptake of EVs amongst Spelthorne residents, visitors and businesses through the provision of easily accessible, convenient public charging infrastructure across Spelthorne.
- Be able to stay up to date with developments in the technologies around EV infrastructure and make necessary updates where appropriate in a timely manner.

Demand for Electric Vehicles and EV Charging

The most significant demand factor for electric vehicle charging provision is the proposed ban of sale of new petrol and diesel cars and vans by 2030. Therefore, it is important that SBC is prepared for the increase in electric vehicles within the borough and ensures sufficient charging provision for all residents.

The chart below outlines the growth in battery electric vehicles (BEVs) and plug in hybrid electric vehicles (PHEVs) from Quarter 1 2014 to Quarter 3 2022.



Source: Department for Transport Statistics – Vehicle Licensing Statistics (Table VEH0132, 2022) <https://www.gov.uk/government/collections/vehicles-statistics>

January 2021, 12.5% of new registered cars sold were battery electric vehicles, by December 2022, that market share has risen to 39.4% battery electric vehicle and Plug in Hybrid Electric Vehicles.

The number of plug-ins on the road is rapidly increasing, with one in five new cars purchased in London being a plug-in electric or hybrid vehicle.

Nationally, in December 2022 alone there were over 50,000 new plug-in vehicle registrations, with 42,000 being pure electric, representing 40% of the market share.

The current charging infrastructure is already showing signs of strain, as news headlines from Christmas 2022 reported that many EV drivers waited for hours for access to charging points. This highlights the inadequacy of the current system during peak demand.

The prices for new electric vehicles are reducing as supply chains are becoming more effective on a global scale, which is contributing to the greater accessibility of electric vehicles and popularisation. Further to this, many car and van manufacturers are responding to government policy and consumer demand through offering both more fully electric models and supplying these models at higher volumes.

With the increasing uptake of BEVs and PHEVs, infrastructure must be established to ensure sufficient supply of chargers to current and future electric vehicle owners.

Below is a chart outlining the predicted number and market share of electric vehicles in Spelthorne by the year 2030 (NEVIS 2023):

Year data relates to				
2030				
region	BodyType	Fuel	Number of vehicles	% of parc
Spelthorne	Cars	Petrol	23,824	45.73%
Spelthorne	Cars	Battery electric	21,734	41.71%
Spelthorne	Cars	Diesel	4,360	8.37%
Spelthorne	Cars	Other EV	2,184	4.19%
Total			52,102	100.00%

Below is a chart detailing the predicted number of electric vehicle charge points required to meet the demands of a moderate uptake of electric vehicles by 2030. Broken down by charger speed (NEVIS 2023):

Year data relates to			
2030			
region	Vehicle type	EVI type	Number of sockets
Spelthorne	Cars	Standard	500
Spelthorne	Cars	Fast	38
Spelthorne	Cars	Rapid	23
Spelthorne	Cars	Ultra-Rapid	26
Total			587

Electric Vehicle Chargers

There are four different types of electric vehicle chargers (demonstrated below). By taking this into account in implementing electric vehicle infrastructure specific use cases and demands can be met.

Below demonstrates the four main types of chargers:

- Slow**
 - Up to 3kW AC chargers
 - 3 pin home plug, used for overnight charging
- Fast**
 - Usually between 7kW and 22kW AC chargers
 - Installed in some properties and car parks
- Rapid**
 - 43kW to 150kW DC chargers
 - Installed in short stay car parks
- Ultra Rapid**
 - Any charger with DC rapid speeds of over 150kW

Table outlining the time to charge popular electric cars from 0% to 100% (AC Charging), and 20% – 100% (DC Charging):

Typical time to charge in hours 0% – 100%				
Charger Speed	Nissan Leaf (2019)	LEVC TX (Taxi)	Renault Zoe (Cheap citycar)	Tesla Model Y (2022 Best Seller)
3-pin plug	27 hrs	14 hrs	23 hrs	36 hrs
3.6kW	17 hrs	9 hrs	14 hrs	22 hrs
7kW	10 hrs	5 hrs	8 hrs	12 hrs
22kW	10 hrs	2 hrs	3 hrs	8 hrs
Typical Charge time in minutes 20% – 80%*				
50kW	50 min	30 min	50 min	60 min
150kW	30 min	N/A	N/A	20 min

Types of Electric vehicles:

Below is a list of electric vehicle types that utilise different technologies:

Require electric charging infrastructure:

- BEV** Battery electric vehicle.
- PHEV** Plug in hybrid electric vehicle.

Require hydrogen supply infrastructure:

FCEV Hydrogen fuel cell electric vehicle.

Existing EV charging infrastructure within Spelthorne.

Most existing EV chargers across the borough are owned and operated by private organisations, on private land.

As of 2023 SBC owns 6 publicly accessible charge points, which are located in Elmsleigh multistorey car park, Staines-upon-Thames.

Developing public charging infrastructure within SBC owned car parks, throughout Spelthorne:

The development of EV charging infrastructure will be approached through provisioning the two charging concepts, residential charging and rapid hub charging. This will ensure that through all uses, electric charging provision will meet both residents and local business needs.

Residential/destination charging.

The residential, or destination charging concept consists of slower charge points, designed to charge cars over longer periods of time to reduce wear on the battery. They are best placed in locations where users complete their journeys. They also enable those who do not have access to charging at home to charge in local car parks/on street overnight.

Residential charging use case:

Catering for residents that do not have access to home charging for their vehicles, the slower 7kw charging enables overnight charging.

On street:

Surrey County Council have conducted pilot installations of their on-street charge point network. There have been 20 installed in the pilots within Spelthorne.

In March 2023, SCC signed a contract with Connected Kerb to supply up to £60 million worth of on street electric vehicle charge points. This commits SCC towards its 2030 target of 10,000 publicly accessible charge points by 2030.

Car parks:

Implementing slower 7kW charge points within car parks located in areas where residents are eligible for paid season tickets would enable these residents to charge their vehicles overnight and over longer periods of time.

Whilst these charge points are not designed for use cases where users are mid-journey and require rapid charging, they serve a purpose in enabling those who are not requiring a rapid charge option a slower charge.

Rapid hub charging:

The rapid hub charging concept consist of a few, ultra rapid charging points designed for use mid-journeys, and by users who want to charge their vehicles in the quickest possible times. the concept is functionally similar to a conventional petrol station. Rapid and Ultra-rapid charge points carry a premium cost as they are able to charge electric cars at much faster rates in comparison to other charge points.

While slower 7kW (fast) chargers are, although limited, becoming available throughout Spelthorne, the 50kW+ (rapid) and 150kW+ (ultra-rapid) chargers are few and far between, with only four currently operational in the area. Thus, taking advantage of this opportunity could lead to a significant advantage in meeting the growing demand. There is now availability for up to 350kW chargers to be installed as technology improves and speeds increase.

The shift towards sustainable electrified transport presents a unique opportunity for SBC to reframe its approach concerning car parks. The versatile nature of electric vehicle charging infrastructure allows for any car park to evolve into the "petrol station forecourt" of the future.

As the sale of petrol and diesel vehicles will be banned in 2030 and electric vehicles become more common, the Council can provide electricity in a similar manner to fuel providers in the past.

EV rapid charging use cases

Providing an EV rapid charging hub in Spelthorne would offer several benefits, including increased accessibility to rapid charging for residents and visitors who may have reservations about adopting new EV technology. This increased accessibility will help to accelerate the adoption of low and zero-emission vehicles throughout the region, and the Borough in particular.

The use of rapid hubs can be similar to petrol stations, meaning that charging can be accessible to those that are used to the petrol station format.

SMEs and taxi drivers are also facing the prospect of electrification within their industries. The presence of a local, easily accessible rapid charging hub would aid in their transition towards more sustainable transport practices.

Additionally, they can ensure that visitors to Spelthorne's town centres will be able to charge their vehicles, which can encourage economic sustainability within these centres.

Location

Spelthorne is a uniquely advantageous location for rapid hub implementation. With the distribution of population centres, coupled with major transportation infrastructure (M3, M25 and Heathrow Airport). There is case that rapid hub concept will be greatly utilised.

Scope for a mixed approach:

To cater for both potential primary use cases of electric vehicle charge points, a mixed speed of charge point approach will be appropriate in some settings, dependent upon user demands.

Proposed outline for charge point implementation:

The implementation of SBC owned and operated charging infrastructure will be conducted in phases.

Both Surrey County Council and private EV infrastructure installers are extending the availability of 7kW destination chargers throughout the borough. As a result, phase 1 will address the requirement for rapid and ultrarapid charge points within Spelthorne that is not currently being met. Phase 2 will build upon the successes of phase 1, enabling the provision of slower destination chargers within SBC owned car parks.

Phase 1: 2023 – 2030

Phase 1 will focus SBC infrastructure on the provision of Rapid and Ultrarapid charge points in strategic locations of high demand. Focusing on the appropriate car parks previously outlined in this document, as there is a shortage of these charge points within and around Spelthorne.

Phase 2: 2025 - 2030

Following the implementation of the much needed rapid and ultrarapid chargers, an extension of Spelthorne's residential/destination charging can be undertaken. Building upon the existing residential charging points. This phase will be undertaken in existing Spelthorne carparks, dependent upon the EV charging demands of their surrounding areas.

Across both phases:

Throughout the proposed implementation timeline will be continued support of both Surrey County Council, and private companies in their development of 7kW destination charge points. Collaborating to ensure even distribution to meet the demands of the borough.

In addition, it is now planning requirement that all new developments with parking must provision electric charging.

Strengthening EV charging infrastructure across Spelthorne Borough Council's offices and investment developments:

In addition to car park EV infrastructure, the Council will seek to increase EV infrastructure within council offices, the depot and leisure centres.

This will increase staff utilisation and enable more staff to consider switching to EVs. It will also enable access for customers of the leisure centres to EV charge points.

Further to this, the development of EV infrastructure within the Council depot will enable further electrification of the Council owned fleet of vehicles in the future.

Knowle Green Estates will provide their tenants with electric vehicle charging capability through installation of EV charge points. This will be dependent upon the relevant demands and user need at each asset.

Challenges and Solutions

The ever accelerating and development of EV and transport technology remains a challenge that must be considered at a strategic level. Spelthorne will need short, medium and long term future-proof plans incorporating a flexible approach to EV charging across the borough in order to optimise commercial advantage and limit risk.

Additionally, SBC will need to consider new approaches, technologies and developments to private low carbon transportation that may have an impact on the Borough. SBC will amend the strategy and relevant policies to reflect these technologies when and if they arise.

Electrical capacity of the local network within Spelthorne will be a key consideration in the future development of EV infrastructure. The Council will work with energy providers and the district network operator (DNO), along with other key actors to develop the capacity required and ensure works undertaken meet the requirements of the DNO.

Generating income from charge points and not a cost, to the Council will depend on utilisation and uptake of EV charging infrastructure and wholesale electricity cost. Given the demands for EV infrastructure are growing exponentially this risk is minimised. Proactive marketing of charge points also reduces the risk of charge points becoming a cost to the Council.

Utilisation of charge points can also be affected by the pricing structure for the charge points. A fair, market driven pricing structure will prevent pricing from hindering the charging infrastructure's financial success. Additionally, concessions can be made in charging prices for residents and businesses within Spelthorne to incentivise the transition to electric vehicles. SBC will explore if this structure can be utilised to manage traffic challenges, and if so, how.

Infrastructure developed as part of phase 1 will require capital investment to see the generation of income. These costs will include the potential for substations from the DNO and the electric charging points themselves. As consumers adopt EVs and utilisation of charge points increases, the returns on this investment will increase.

Flooding is a challenge that must be considered within Spelthorne. Any future development of EV infrastructure within the borough must consider mitigating factors to flooding in place.

Anti-social behaviour and vandalism can negatively impact EV charge point infrastructure. To prevent this, enforcement in addition to lighting and cameras can be implemented in each development. This must be considered during implementation and maintenance of the charge points.

Ensuring that all electric charge point users can use all EV charge point infrastructure is paramount. Any development should include measures to enable accessibility for people of all abilities.

Technological Risks:

There remains the risk of emerging technologies within personal transport that may make conventional EV charging obsolete. Technologies such as better battery solutions, hydrogen or other unforeseen developments. This would have an adverse effect on any existing or future EV charging infrastructure planned and outlined within this strategy. Therefore, an element of focus must be kept on the technological progress of emerging technologies to ensure we are adaptable.

Targets and measurements plan of delivery

Below is a table outlining the key aims and metrics that enable the delivery of electric vehicle charge points and the overall visions of the EV strategy.

Methodology for measurement will encompass annual data collection from online sources (ZapMap) coupled with internal SBC data. This data collection will be presented through annual update reports published under this strategy.

Aims	Target	Baseline	Metric
Income generation from SBC owned charge points.	To increase the income generated by SBC owned charge points	£952 in total (generated from 6 chargers in the period 2020 – 2023)	Amount of income generated for the Council
Making EV charge points accessible for residents.	Increase the number of SBC owned charge points, enabling charging for residents, and generating income.	6 publicly accessible SBC charge points	Number of publicly accessible SBC charge points.
Make charging infrastructure more accessible	400 publicly accessible charge points	54 publicly accessible charge points	Number of publicly accessible charge points
To reduce the number of petrol- and diesel-powered vehicles in Spelthorne	A reduction in petrol and diesel vehicles by 20,000 by 2030.	50,000 petrol and diesel vehicles as of 2023.	Reduction in number of petrol- and diesel-powered vehicles.

Annual deliverables	
Indicator	Measurement
Number of SBC owned charge points installed	Council Data
Number of overall publicly accessible charge points installed within the borough (Private + Surrey County Council)	Data provided by ZapMap*

*a private company that records and presents all publicly accessible charge points

Continuous review

As transport is an ever-changing industry, this document must be continually reviewed and updated with the most up to date information to ensure that the strategy remains fit for purpose. This strategy is to be formally revisited on an annual basis.