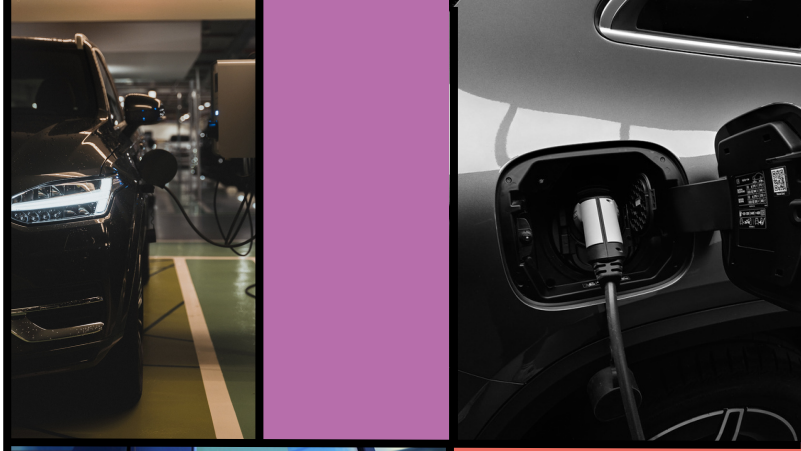


Electric Vehicle Charging Infrastructure Strategy

Working Paper 2 - Policy and Operational Context

TRANSPORT FOR THE South East

ARCADIS

Transport for the South East (TfSE) Electric Vehicle Charging Infrastructure Strategy

Working Paper 2 - Policy and Operational Context

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Prepared By:
Arcadis Consulting (UK) Limited
80 Fenchurch Street
London
EC3M 4BY

Prepared For:
Transport for the South East

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Glossary

Acronym	Description	Acronym	Description
BEIS	Department for Business, Energy, and Industrial Strategy	**LEVI**	Local EV Infrastructure
BEV	Battery Electric Vehicle	**ORCS**	On-street Residential Chargepoint Scheme
BSI	British Standards Institute	**OZEV**	Office for Zero Emissions Vehicles
CaaS	Charging as a Service	**PEMD**	Power electronics, Machines and Drives
CCS	Combined Charging System	**RCF**	Rapid Charging Fund
CPO	Charge Point Operator	**RCV**	Refuse Collection Vehicle
DNO	Distribution Network Operator	**SOC**	State Of Charge
DSO	Distribution Systems Operator	**SRN**	Strategic Road Network
EV	Electric Vehicle	**SSEN**	Scottish and Southern Electricity Network
EVCI	Electric Vehicle Charging Infrastructure	**TCO**	Total Cost of Ownership
EVCP	Electric Vehicle Charging Point	**UKRI**	UK Research & Innovation
EVHS	Electric Vehicle Home charging Scheme	**ULEV**	Ultra Low Emission Vehicle
ICE	Internal Combustion Engine	**WCS**	Workplace Charging Scheme
LA	Local Authority	**ZEV**	Zero Emission Vehicle
LTA	Local Transport Authority		

Executive Summary

Introduction

This Policy and Operational Context Working Paper is a detailed review of opportunities and barriers for Electric Vehicle Charging Infrastructure (EVCI) rollout in the Transport for the South East (TfSE) area. These opportunities and barriers are derived from an assessment of policy and strategy, market trends and challenges, operating models, funding, and fleet electrification guidance as factors influencing EVCI rollout.

One of TfSE's strategic priorities is to '*achieve a reduction in carbon emissions to net zero by 2050 at the latest and to minimise the contribution of transport and travel to climate change'.* The transport sector is one of the largest contributors to carbon emissions. In 2019, surface transport accounted for 27% of the total UK emissions, with cars contributing 60% of this[1]. Electric vehicle (EV) technology has already been proven to be a commercially viable replacement for traditional fossil-fuel powered vehicles. The UK government has pushed forward its commitment to ban new diesel and petrol vehicles from 2040 to 2030. A series of national, regional, and local policies have been published setting out the need for EVCI rollout to support the mass adoption of EVs. This Policy and Operational Context Working Paper provides an overview of these policies, highlighting the key commitments and alignment to TfSE study area.

TfSE comprises of sixteen local transport authorities (LTAs) and forty-six district and borough authorities. The TfSE mission is to 'grow the South East's economy by delivering a safe, sustainable and integrated transport system[2]. This paper aligns with TfSE's mission, providing background information on the opportunities and barriers relevant to EVCI rollout, and informing the basis for the next stages in delivering inclusive, accessible, and effective EVCI across the south east. By considering the opportunities and barriers for EVCI rollout, guidance and recommendation can be provided on the most appropriate approach local transport authorities should take towards delivering EVCI provision.

Policy and Strategy Review

According to HM Government's 'Taking Charge – The Electric Vehicle Infrastructure Strategy',[3] LTAs are responsible for publishing their own EV strategies, complete with a commercial and cross-sector approach that integrates into broader transport plans. To establish this approach and develop an EVCI rollout plan, these LTAs are supported by funding and guidance, set out by regional and national policy. Regional policies typically offer a comprehensive approach to EV infrastructure rollout and set out specific targets that take into consideration the challenges and opportunities on a regional scale. On a national level, policies aim to remove charging infrastructure as both a perceived, and an actual barrier to the adoption of electric vehicles.

As of summer 2022, only three of the sixteen LTAs comprising the TfSE area have specific EV/Ultra Low Emission Vehicle (ULEV) strategies: Surrey County Council (EV strategy), West Berkshire Council (ULEV strategy) and West Sussex County Council (EV strategy). Eight other LTAs have an EV strategy in development. West Berkshire Council has a target of 25% of all vehicles to be ULEVs by 2030 and West Sussex County Council has a target of 70% of all new cars to be EV by 2030. Slough Borough Council has a Low Emissions strategy that includes EVCI provision, as do Kent County Council and Medway Council. These support the take-up of ultra-low emission vehicles (ULEVs), including cars, taxis and commercial vehicles. Out of the forty-six district and boroughs authorities, four of them have their own EV strategy. These are Swale Borough Council, Horsham District Council, Sevenoaks District Council and Waverley Borough Council. Figure 1 lists key national, regional and local policies and strategies. EV or ULEV strategies which are in development by LTAs in the TfSE area are shown as dotted arrows.

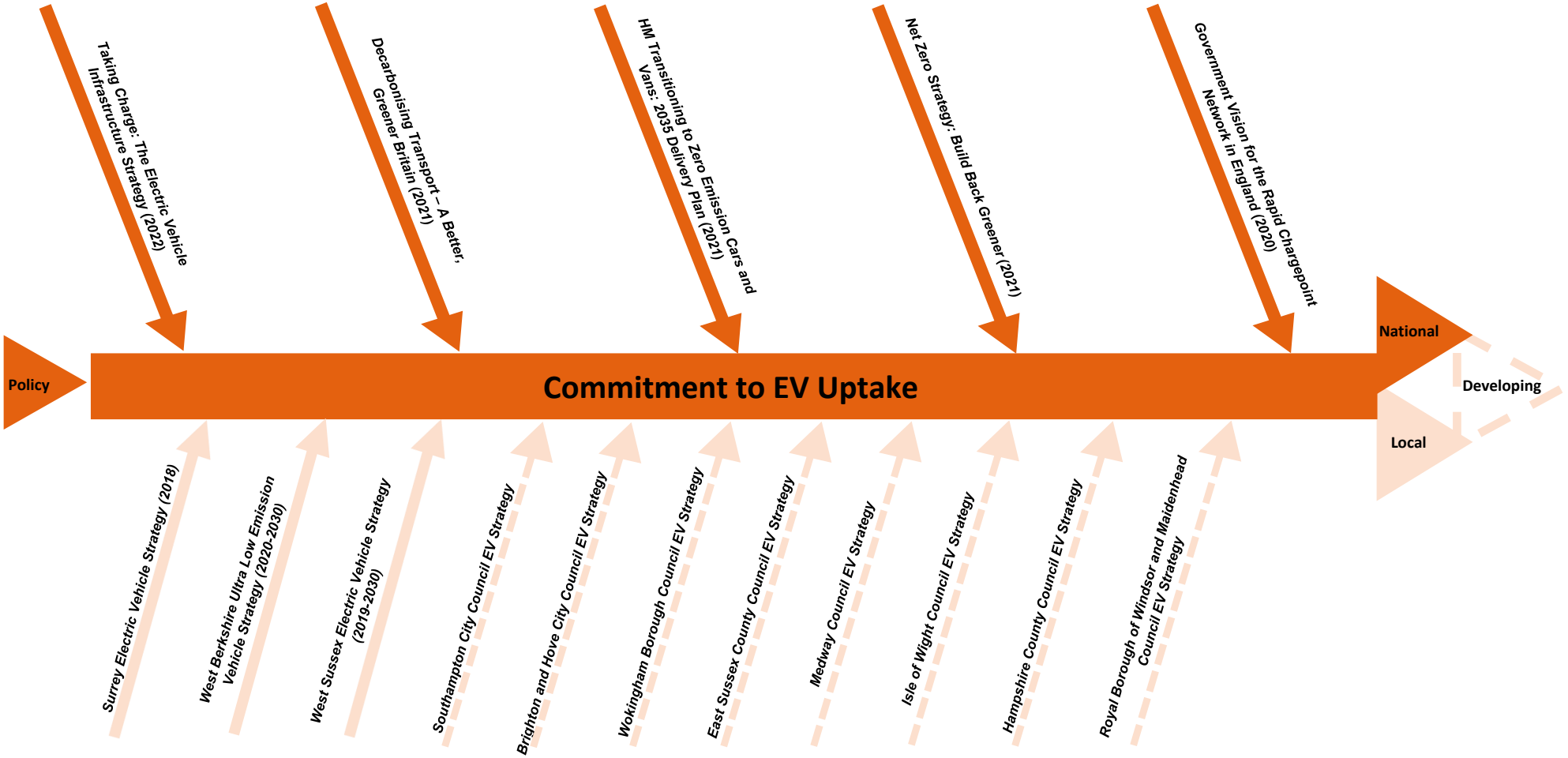
The TfSE area is covered by two Distribution Network Operators (DNOs), Scottish and Southern Electric Networks (SSEN) and United Kingdom Power Networks (UKPN). The DNOs' strategies both include commitments to support the development of local EVCI policies and roll-out plans by sharing data and models to inform decision making. Engagement with the DNOs is an essential element in the creation of the TfSE EVCI strategy and the relationships should be established to underpin its successful implementation.

[1] DfT, 'Transport and environment statistics: Autumn 2021' (2021). https://www.gov.uk/government/statistics/transport-and-environment-statistics-autumn-2021/transport-and-environment-statistics-autumn-2021

[2] TfSE, 'Transport Strategy' (2020). https://transportforthesoutheast.org.uk/useful-documents/transport-strategy/

[3] HM Government, 'Taking charge: the electric vehicle infrastructure strategy' (2022). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065576/taking-charge-the-electric-vehicle-infrastructure-strategy.pdf

Figure 1 Key national, regional and local policy commitments



Market Trends

The growing trend of EV adoption is attributed to improvements in performance (due to a progressive increase in EV battery size and range) and a reduction in purchase price (due in part to continual reductions in the cost of batteries). Further details on these trends can be found below:

- **Battery Range** - As technological advances in battery size and range continue, the frequency of needing to recharge reduces, increasing the confidence to travel further distances. This also minimises the level of behaviour change for the average driver, as 'range anxiety' is limited. Despite promises of EVs with a range of 500+ miles, range increases will be limited by battery size, weight and cost.
- **Charging Speed** - The State of Charge (SOC), or percentage of the battery's full charge, has a significant effect on the maximum power and hence time to charge. When batteries are nearly empty and have a low SOC, maximum charging rates are achievable. However, as the SOC increases, the charging-speed reduces. While some newer EVs will be able to charge at much higher power levels, they can only sustain the highest charge rates across a smaller SOC range. Whilst it is expected that battery EV charging capability will further improve in the future, research shows that maximum power levels of up to 150kW are likely to be sufficient for most EV cars and light vans.
- **Price** - Analysts predict a continuation in the progressive trends of EV adoption (43% increase in global EV sales in 2020[4]). Given these projections, it can be reasonably assumed that EVs will become more affordable, and the second hand market will expand making EVs a viable choice for a wider range of consumers.

Market Challenges

As the EV market develops at pace, a series of market challenges for EVs and EVCIs are emerging as outlined below:

- **Uncertainty over requirements for EV demand** - It is acknowledged that 'specific predictions of the future mix and number of chargepoints are inherently uncertain in 2022 due to rapid developments in battery and charging technology, and because consumer preferences about where and when they would like to charge are still emerging'[5].
- **On Street Charging Infrastructure** - On-street charging provision presents a fundamental challenge for local authorities. Some LTAs, such as Kent County Council, are unable to consider lamppost charging solutions due to health and safety considerations.
- **Lead Times -** Drivers switching to EVs are currently waiting approximately eight months before they receive their vehicle[6]. Until resolved, these supply issues will impact the rate of EV uptake.
- **Funding –** Changes in Government funding initiatives (e.g., EV grants, EVCI investments) create forecasting and planning challenges for LTAs. Introduction of vehicle excise duty for EVs from 2025 will present a cost barrier for some owners which could slow the uptake of EV adoption.[7]
- **Volatility in energy market –** The uncertainty in energy costs has raised concern in the EV market. The 2022 energy crisis has caused EV charging prices to rise which may in the short term, 'price-out' potential EV adopters.
- **Second hand market development –** The average second hand price of an EV is more than double that for petrol and diesel cars. Average prices are changing slowly as the second hand market for EVs develops. Second hand EV prices dropped 0.8% (currently £36,445) over the past five months. Petrol and diesel increased by 0.6% (£16,666) and 0.5% (£16,723) respectively over the same period[8].

[4] EV Volumes, 'Global EV Sale for 2022'. https://www.ev-volumes.com/
[5] HM Government, 'Taking Charge: The Electric Vehicle Infrastructure Strategy' (2022) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065576/taking-charge-the-electric-vehicle-infrastructure-strategy.pdf
[6] Electrifying.com, 'Why wait? How to beat the queue for a new electric car' (2022). https://www.electrifying.com/blog/article/waiting-times-for-electric-cars
[7] The Guardian, 'Electric car owners to pay road tax from 2025, Jeremy Hunt announces' (2022). https://www.theguardian.com/uk-news/2022/nov/17/electric-car-owners-to-pay-road-tax-from-2025-jeremy-hunt-autumn-statement
[8] Fleetworld, 'Used EV prices soften but many models outperform market' (2023). Used EV prices soften but many models outperform market (fleetworld.co.uk)

Public and Private Operating Models

Table 1 summarises the range of typical options for operating models from which LTAs can choose for their EVCI installations.

Table 1 Types of operating models

	LTA Own and Operate	LTA Led Private Operated	Hybrid	Fully Funded Concession Contract	Private Own Operated
Supply of Land	LTA	LTA	LTA	LTA	Private
EVCP Cost	LTA	LTA	LTA	Private	Private
Installation	LTA	LTA	Private	Private	Private
Maintenance	LTA	Private	Private	Private	Private
Revenue Risk	LTA	Mixed	Private	Private	Private

Most LTAs within the TfSE study area are using a fully funded concession contract or a hybrid model especially for on-street chargepoints. However, for council owned car parks some operate an LTA own and operate model. By taking on full responsibility for chargepoints, local authorities gain control but at the expense of potentially high capital-costs for installation, ongoing maintenance and revenue risk.

A review of public and private operating models helps inform the action plan and recommendations for TfSE's strategy. TfSE can support LTAs to collaborate on issues, challenges and opportunities with regards to procurement options.

Funding

Government grants, end user charges and private funding are options for funding or recovering capital costs for setting up EVCI. Private sector chargepoint operators (CPOs) also invest in EVCI. The Office for Zero Emission Vehicles (OZEV) offers a range of grants, incentives, assistance, and funding to help individuals and businesses make the switch to EV. Local authorities can also seek funding from OZEV. Table 2 sets out the current funding available.

Table 2 Types of government funding

Funding	Description
Rapid Charging Fund (RCF)	Part of a £950 million fund to future-proof electrical capacity at motorway and major A road service areas to prepare the network for 100% zero emissions vehicles (ZEV) uptake. Available to fund a portion of costs at strategic sites in cities and rural areas across the strategic road network where the costs of upgrading sites to meet future charging demand is not commercially viable. To help businesses with the costs of connecting high-powered chargepoints to the electricity grid, where those costs would prevent private sector investment.

Funding	Description
Local EV Infrastructure Fund (LEVI)	The £450 million fund has been launched to help LTAs leverage private sector investment into their public charging networks and roll-out long-term, sustainable EVCI. A pilot was launched in 2022, with £20 million from government and industry funding for pilot winners and a further £10 million for existing chargepoint schemes. Kent County Council and West Sussex have each secured funding from the first and second tranches of pilot funding.
On-Street Residential Chargepoint Scheme (ORCS)	This fund provides LTAs access to grant funding that can be used to part-fund the procurement and installation of on-street EV chargepoint infrastructure. The new LEVI fund builds on the success of the On-Street Residential Chargepoint Scheme (ORCS) and growing demand from LTAs, with a further £10 million in funding brought forward for this year, bringing this year's ORCS funding to £30 million. Amendments have been made to the scheme to ensure more local authorities benefit from the funding, improve the consumer experience of charging and allow for chargepoint installations on more types of suitable land. Over 1,000 on street chargepoint applications have been approved in the South East Region[9].
EV Chargepoint Grant	From April 2022, as part of the replaced Electric Vehicle Home charge Scheme (EVHS), the government offers an EV chargepoint grant to landlords for single use, multi-use and commercially let properties that have parking dedicated for staff use or fleet use of the tenant or prospective tenant. Funds 75% of the total cost of buying and installing an OZEV approved chargepoint, up to a maximum of £350 per socket installed. This grant is also open to people who live in rental accommodation or own a flat. Over 50,000 chargepoints have been installed in the South East Region from the grant.[10]
The Workplace Charging Scheme (WCS)	Funding towards the cost of the purchase and installation of EVCPs at workplaces. The scheme can be applied for by any eligible business, charity or public sector organisation. The Government will continue to fund the WCS until at least 2024/25.

[9] HM Government, 'Electric vehicle charging device grant scheme statistics: October 2022' (2022) https://www.gov.uk/government/statistics/electric-vehicle-charging-device-grant-scheme-statistics-october-2022
[10] HM Government, 'Electric vehicle charging device grant scheme statistics: October 2022' (2022). https://www.gov.uk/government/statistics/electric-vehicle-charging-device-grant-scheme-statistics-october-2022

Fleet Electrification Review

The fleet electrification review provides an overview of published guidance. This will be used to help guide the development of the strategy and in particular the forecasting of fleet infrastructure demand methodology. The documents that have been reviewed and key guidance highlighted include:

- The Energy Savings Trust Step-by-Step Guide to Electric Fleets.
- Department of Transport's Zero Emission Fleets: Local Authority Toolkit.
- Scottish and Southern Electricity Networks Connecting your EV Fleet Guide.

Conclusion

The TfSE area consists of 16 local transport authorities and 46 borough and district authorities. The majority of the study area is rural, with large counties such as East Sussex, West Sussex, Kent, Surrey and Hampshire. However, the study area also covers cities and heavily built-up areas surrounding London. There are unique challenges associated with implementing chargepoints within the TfSE area given the diverse nature.

A regional EVCI strategy provides direction, guidance and support for the LTAs, including forecasting demand for EVCPs, resulting in more effective EVCI implementation. The regional strategy will include an action plan. TfSE will have a critical role to play in executing the action plan, operating as a key facilitator for the region. TfSE will bring LTAs and other key stakeholders together to share EVCI related challenges, issues and seek solutions and opportunities to support their own strategies. In addition, TfSE can gather and disseminate the latest intelligence on funding and national policies.

As of the summer of 2022, only Surrey County Council, West Sussex County Council and West Berkshire Council have published EV or ULEV strategies. Eight other LTAs have an EV strategy in development.

Analysis of other relevant LTA policy documents, including local transport plans and environmental strategies, confirms that the need for increased EVCI provision is widely recognised and referenced, although often without stated targets for EVCI provision.

DNO strategies include their commitments to support the development of local EVCI policies and roll-out plans by sharing data and models to inform decision making. Engagement with the DNOs is an essential element in the creation of the TfSE EVCI strategy, and subsequent successful implementation of the strategy.

The growing trend of EV adoption is linked to a progressive increase in EV battery size and range and a reduction in EV purchase prices. As EVs approach price parity with Internal Combustion Engine (ICE) vehicles, the rate of EV adoption is expected to increase.

LTAs can access public sector funding to contribute to the costs of ECVP installation and operation. These include the ORCS and the LEVI funding. Kent County Council and West Sussex Council both secured funding from the LEVI pilot fund.

Typical operating models include options where private sector funding is used to install and maintain EVCPs at no cost to LTAs. Each operating model has advantages and disadvantages, which are summarised to help inform selection of the best-fit operating model given each LTA's circumstances.

1 Introduction

1.1.1 Transport for the South East (TfSE) comprises of sixteen local transport authorities (LTAs) and forty-six borough and district authorities. The TfSE mission is to 'grow the South East's economy by delivering a safe, sustainable and integrated transport system[11]'. This is consistent with the UK Government's vision to remove both the perceived and real barriers of charging infrastructure to the adoption of electric vehicles (EVs)[12].

1.1.2 This working paper has been commissioned by TfSE to establish the current policies, operational trends and challenges that impact the roll out of electric vehicle charging infrastructure (EVCI) across the region. It provides a review of relevant national and local policies, strategies and legislation and identifies potential funding sources. Electric vehicle (EV) and EVCI market trends and challenges are assessed, and operating model options are reviewed.

1.1.3 The working paper comprises seven sections, with appendices providing further supporting detail and analysis.

- Policy and strategy review
- DNO strategy
- Market trends and challenges
- Public and private operating models
- Funding
- Fleet electrification guidance
- Conclusions

[11] TfSE, 'Transport Strategy' (2020). https://transportforthesoutheast.org.uk/useful-documents/transport-strategy/
[12] HM Government, 'Taking Charge: The Electric Vehicle Infrastructure Strategy' (2022). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065576/taking-charge-the-electric-vehicle-infrastructure-strategy.pdf

2 Policy and Strategy Review

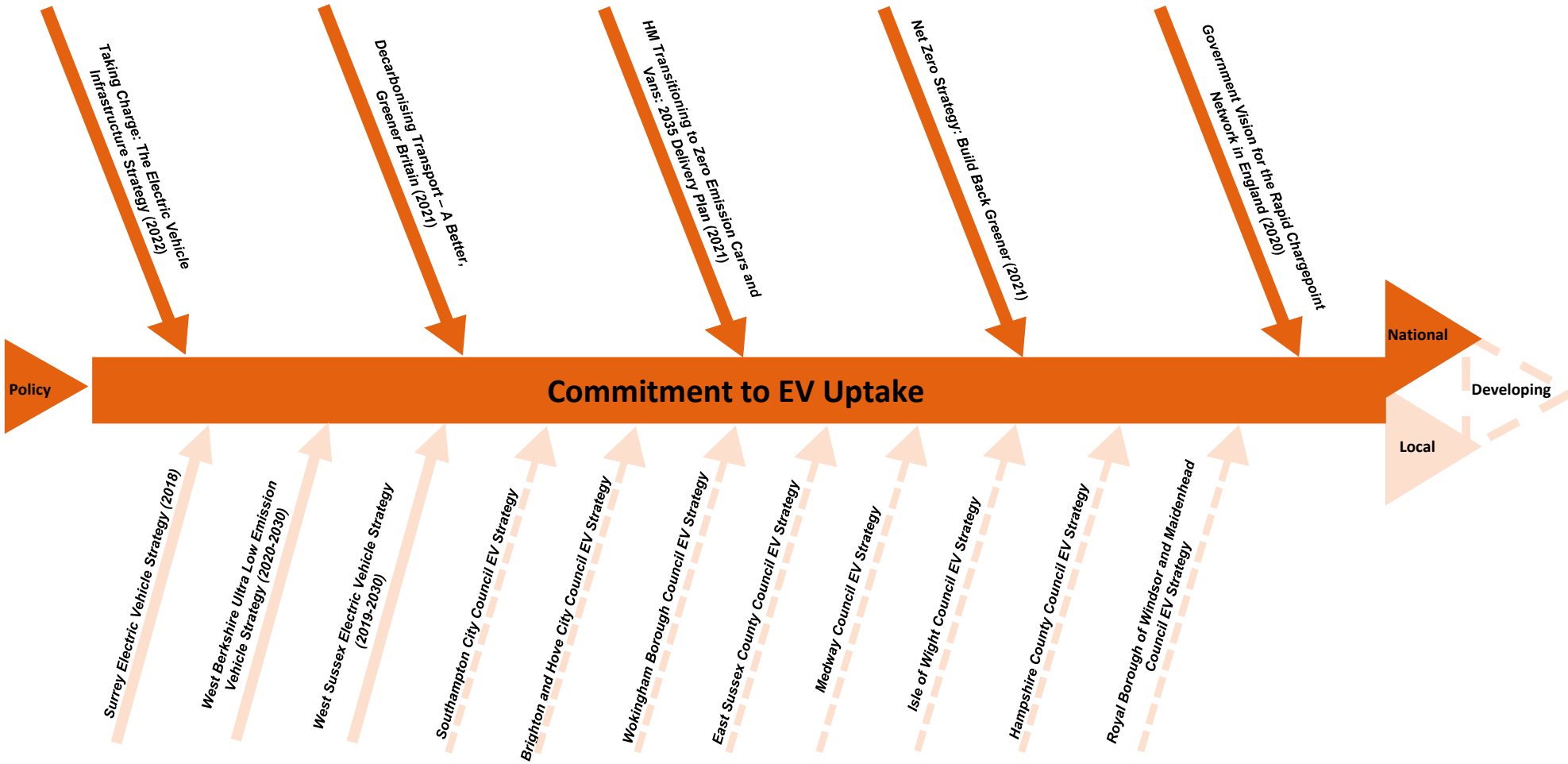
2.1 Introduction

2.1.1 This section outlines relevant national, regional and local policies, strategies and legislation. This includes policy targets, local objectives, and commitments for EV uptake/infrastructure.

2.1.2 Published EV/EVCI strategies have been reviewed from the 16 local transport authorities (LTAs) and 46 district and borough authorities within the TfSE area. In addition, a survey was issued by TfSE to the local authorities in order to understand the status of development of their own local EV strategies. For those LTAs without a published EV/EVCI strategy, policy, and strategy documents with reference to electric vehicles and charging infrastructure have been reviewed and referenced in this section.

2.1.3 Figure 2 lists key national and local policies. This figure represents published EV strategies and data received in response to the survey. EV or ULEV strategies which are in development by LTAs in the TfSE area are shown as dotted arrows.

Figure 2 Key national, regional and local policy commitments



2.2 National Policies

2.2.1 There are legal commitments to bring all greenhouse gas emissions in the United Kingdom to net zero by 2050[13]. The transport sector is a significant contributor to carbon emissions, accounting for 27% of the total UK emissions, of which cars contributed 60%[14], in 2019. EVs are viable alternatives to fossil-fuel powered vehicles. For these reasons, the UK government has brought forward its commitment to ban sales of new diesel and petrol vehicles from 2040 to 2030. National policies have been put in place to support the widescale transition to EVs.

2.2.2 The following section summarises the key commitments, objectives, and targets in national policies for the uptake of EVs and roll out of EVCI. Further analysis of each policy document is available in Appendix 1.

Taking Charge: The Electric Vehicle Infrastructure Strategy (2022)

2.2.3 'Taking Charge: The Electric Vehicle Infrastructure Strategy' (2022) sets out the government's vision and action plan for the rollout of EVCI in the UK. This ensures the UK is on track to meet key deadlines, which include the end of sale of new petrol and diesel vehicles by 2030 and for all new cars and vans to be fully zero emission at the tailpipe by 2035[15].

2.2.4 The UK government's vision is to fully remove EVCI provision as a barrier to EV adoption by 2030. Taking Charge states achieving this will require an estimated minimum 300,000 public EVCPs and a national network that:

- Facilitates effortless on and off-street charging for private and commercial vehicles.
- Is inclusively designed, fairly priced, and available for all.
- Delivers a thriving EV and EVCI private sector.
- Integrates with smart energy system.
- Harnesses innovative EV and EVCI technologies to improves operation and user experience.

2.2.5 To achieve this, the government has identified the following five strategic areas that should be prioritised. These are as follow:

- Focus intervention on two crucial sectors where accelerated rollout is needed and where business cases can be challenging:
  - high powered chargers on the strategic road network.
  - local on-street charging.
- Allow thriving sectors to thrive and address barriers to private sector rollout.
- Give people confidence in the public network. Regulate to ensure chargepoints are reliable and easy to use.
- Work with Ofgem to ensure chargepoints can seamlessly integrate with the energy system.
- Support innovation in business models and technology.

2.2.6 On the role that regional EVCI strategies can play:

- Providing a mechanism for better local engagement, leadership, and planning.
- Developing localised forecasts to support LAs in developing EVCI roll-out plans.

2.2.7 The strategy includes a series of commitments aimed at removing EVCI availability as a perceived and real barrier to EV adoption:

- Ensuring that each motorway service area has at least 6 high power EVCPs by 2023.
- Continuing to support local authorities through the On Street Residential Chargepoint Scheme.
- Expanding the £10m Local EV Infrastructure funding, piloted in 2022.
- Investing at least a further £500m to support LAs plan and deliver local public EVCI between 2022 and 2025.
- Developing new EVCI standards to ensure sure public EVCI is reliable and easy to use.

[13] HM Government, 'UK becomes first major economy to pass net zero emissions law' (2019) https://www.gov.uk/government/news/uk-becomes-first-major-economy-to-pass-net-zero-emissions-law
[14] DfT, 'Transport and environment statistics: Autumn 2021' (2021) https://www.gov.uk/government/statistics/transport-and-environment-statistics-autumn-2021/transport-and-environment-statistics-autumn-2021
[15] HM Government, 'UK electric vehicle infrastructure strategy' (2022). https://www.gov.uk/government/publications/uk-electric-vehicle-infrastructure-strategy

Decarbonising Transport – A Better, Greener Britain (2021)

2.2.8 'Decarbonising Transport – A Better, Greener Britain' (2021) sets out the government's commitments and actions needed to decarbonise the entire transport system in the UK. It includes the principles and pathway to net zero transport in the UK, as well as the benefits net zero transport will deliver[16].

2.2.9 Key targets, objectives and commitments include:

- Introduction of a zero-emission vehicle (ZEV) mandate setting targets for manufacturers where a certain percentage of their sales must be zero emission from 2024.
- Ending the sale of new petrol and diesel cars and vans from 2030, with all new cars and vans being zero tailpipe emissions from 2035.
- Ending the sale of all new, non-zero emission road vehicles by 2040.
- £12 billion invested into local transport systems to support decarbonisation.
- Additional £620 million to support the transition to EVs, particularly focusing on the implementation of EVCPs in residential areas.
- Building a globally competitive ZEV supply chain and encourage data sharing across the transport sector.
- 25% of the UK Government car fleet to be ultra-low emission by December 2022 and all government vehicles to be zero emission by 2027.

HM Transitioning to Zero Emission Cars and Vans: 2035 Delivery Plan (2021)

2.2.10 HM Transitioning to Zero Emission Cars and Vans: 2035 Delivery Plan (2021) sets out the milestones leading to the end of the sale of new petrol and diesel cars and vans by 2030[17].

2.2.11 Key targets, objectives and commitments include:

- Continue to fund the plug-in van grant until at least 2022/23.
- Support provision of on-street chargepoints until at least 2024/25.
- Continue to fund the EV Home charging Scheme (EVHS) until at least 2024/25.
- Continue to fund the Workplace Charging Scheme (WCS) until at least 2024/25.
- Accelerate Government fleet commitment – 100% of the car and van fleet will be fully zero emission at the tailpipe by 2027.

Net Zero Strategy: Build Back Greener (2021)

2.2.12 The 'Net Zero Strategy: Build Back Greener' (2021) sets out policies and proposals for decarbonising all sectors of the UK economy to meet our net zero target by 2050[18].

2.2.13 Key targets, objectives and commitments include:

- 2030 – end sale of new petrol and diesel cars and vans.
- 2035 – all new cars and vans must be 100% zero emission at the tailpipe.
- £2.8 billion to support the switch to clean vehicles across the UK, through a range of funding packages.
- UK's emissions must be net zero by 2050.
- UK Government commitment to demonstrate zero emission HGV technology on UK roads this year (2021) through zero emission road freight trails. They also state a commitment to stimulate demand for zero emission trucks through financial and non-financial incentives.

Government Vision for the Rapid Chargepoint Network in England (2020)

2.2.14 The 'Government Vision for the Rapid Chargepoint Network in England' (2020) sets out the UK's commitment to support growth of green, zero emission technologies[19].

2.2.15 Key targets, objectives and commitments include:

- Rapid Charging Fund (RCF) to support Government ambitions, comprising of a £500 million commitment to EV charging infrastructure ensuring long-term consumer demand for EV chargepoints is met. This is to fund

[16] Gov.uk, 'Transport decarbonisation plan' (2021). https://www.gov.uk/government/publications/transport-decarbonisation-plan
[17] Gov.uk, 'Transitioning to zero emission cars and vans: 2035 delivery plan' (2021). https://www.gov.uk/government/publications/transitioning-to-zero-emission-cars-and-vans-2035-delivery-plan
[18] Gov.uk, 'Net Zero Strategy: Build Back Greener' (2021). https://www.gov.uk/government/publications/net-zero-strategy
[19] Gov.uk, 'Government Vision for the Rapid Chargepoint Network in England' (2020). https://www.gov.uk/government/publications/government-vision-for-the-rapid-chargepoint-network-in-england/government-vision-for-the-rapid-chargepoint-network-in-england

sites on the Strategic Road Network (SRN) where upgrading connections to high powered chargepoints is prohibitively experienced and uncommercial.

- Government ambitions timeline
  - 2023 – To have at least 6 high powered, open access chargepoints[20](150 – 350 kW capable) at motorway service areas in England, (some larger sites having as many as 10-12).
  - 2030 – Plans for approximately 2,500 high powered chargepoints across England's motorways and major A roads.
  - 2035 – Expect 6,000 high powered chargepoints across England's motorways and major A roads.

Automated and Electric Vehicles Act (2018)

2.2.16 The 'Automated and Electric Vehicle Act' 2018 provided power, through secondary legalisation, to the government to regulate and improve the consumer experience of charging infrastructure.[21]

2.2.17 Key targets, objectives and commitments include:

- Ensuring accessible networks and consistent technical standards for EVCPs.
- Requiring provision of transparent data on infrastructure location and the availability of public chargepoints.
- Ensuring provision of EVCPs at significant strategic locations, and to require that chargepoints have 'smart' capability.

2.2.1 This legislation has been developed to support the provision of high-quality, accessible and convenient EVCI in line with government required standards.

2.2.2 The following national strategies are more than three years out of date and therefore, these have been superseded by the strategy and policy documents listed above. A summary of these superseded documents is included in Appendix 1 for completeness:

- *Department for Transport (DfT) Road to Zero (2018)*
- *Clean Air Strategy (2019)*

National Policy Summary

2.2.3 National policies aim to remove charging infrastructure as both a perceived, and real, barrier to the adoption of electric vehicles. This is reflected within 'Taking Charge: The Electric Vehicle Infrastructure Strategy' (2022), in which funding availability was set out for Sub-national Transport Bodies (STBs) in 2021-2022 to produce regional assessments to support energy system stakeholders and local authorities in planning charging infrastructure provision[22]. This study is TfSE's regional response to the following obligations set out in 'Taking Charge: The Electric Vehicle Infrastructure Strategy' (2022):

- Produce scenarios for potential demand for EV infrastructure in the region.
- Identify clusters of demand in the region, including bringing together data on current demand and potential future demand from fleets operating in the region.
- Identify different levels of engagement and progress within local authorities in the region and locations where additional support is needed to enable planning of local chargepoints.
- Highlight examples of best practices between local authorities and foster partnerships between authorities to ensure charging infrastructure is delivered in an efficient and cohesive manner.

[20] These high powered chargepoints are able to charge up to 3 times faster than most of the chargepoints currently in place and can deliver around 120-145 miles of range in just 15 minutes for a typical electric vehicle.
[21] Gov.uk, 'Automated and Electric Vehicles Act 2018 regulatory report' (2021). Automated and Electric Vehicles Act 2018 regulatory report - GOV.UK (www.gov.uk)
[22] HM Government, 'Taking Charge: The Electric Vehicle Infrastructure Strategy' (2022) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065576/taking-charge-the-electric-vehicle-infrastructure-strategy.pdf

2.3 Regional Framework

2.3.1 Figure 3 illustrates the geographical extent of the TfSE area. Section 2.3 summarises the only existing regional EVCI document for the TfSE area.

Figure 3 Transport for the South East regional map (source: TfSE)

Hampshire County Council's Southern Regional Framework for Electric Vehicle Charging Infrastructure (2022)

2.3.2 The Southern Regional Framework for Electric Vehicle Charging Infrastructure covers Hampshire and the South of England, offering a "one stop shop" for Public Sector EVCP delivery and management[23]. The framework includes the following opportunities for any public sector organisations or Trust to understand, develop and deliver their requirements for EV charging, including:

- Feasibility.
- Installation and deployment.
- Adoption of existing charging points.
- Chargepoint service and management.

2.3.3 The framework offers:

- Provision of a procurement route for the public sector to obtain, develop and deliver EV chargepoints.
- Collaboration with suppliers to identify funding options, following desktop assessments.
- Access private and grant funding to support public sector investment.
- Provide an option of a consistent, quality user interface across the region for the general public and public sector organisations, which can be accessible to drivers nationally.

2.3.4 This regional framework provides a mechanism for LTAs within the South East to develop and jointly deliver EVCI in the TfSE area.

[23]Hampshire County Council, 'Southern Regional Framework for Electric Vehicle Charging Infrastructure – Framework Customer Access Agreement', (2022). https://documents.hants.gov.uk/ccbs/EVFrameworkCustomerAccessAgreement.pdf

2.4 Local Transport Authority EV Strategies

2.4.1 LTAs have a crucial role to play in the rollout of EVCI, which Government guidance[24] outlines as:

- Proactively supporting and delivering the rollout of electric vehicle chargepoints.
- Helping to ensure the transition is integrated into wider local transport and community needs.
- Through policies and published strategies, local authorities can facilitate and help guide the market to deliver to meet the charging needs of residents, businesses and visitors.
- Writing or being part of a wider local EV or EV infrastructure strategy is vital to establishing objectives, ways of working, responsibilities and a pathway to delivery.
- Accessing funding and procuring installation, operation and maintenance for EVCI.
- Engaging with local business and the public to raise awareness of available EVCI.

2.4.2 Table 3 provides an overview of the EV strategies published (3) or in development (8) for the 16 LTAs within the TfSE area. To date, Surrey County Council, West Berkshire Council and West Sussex County Council are the only LTAs within the TfSE area to have published EV or EVCI strategies. This section details the key targets, objectives and commitments relating to EV uptake and charging infrastructure within these strategies.

2.4.3 A survey was undertaken by TfSE in April and October 2022 to determine which LTAs had EV or EVCI strategies in development. Table 3 shows which LTAs responded and indicated they had a strategy in development.

2.4.4 The Slough 'Low Emissions Strategy' and the Kent and Medway 'Energy and Low Emissions Strategy' include charging infrastructure strategies. Of the LTAs that have not published an EV/EVCI strategy, several have produced other documents which contain EV or EVCI related targets, objectives and commitments. These are summarised in Section 2.4. Further targets, commitments and forecasts relating to EV and EVCI is presented in Appendix 2 Table 15Table 15 .

[24] HM Government, 'Electric vehicle charging infrastructure: help for local authorities' (2022). Electric vehicle charging infrastructure: help for local authorities - GOV.UK (www.gov.uk)

Table 3 LTA EV strategy summary

Local Transport Authority	Known Published Strategy	Known Strategy in Development
Portsmouth City Council		
Slough Borough Council	Some details within Slough Low Emissions Strategy	
Southampton City Council		Yes
Reading Borough Council		
West Berkshire Council	Yes	
Brighton and Hove City Council		Yes
Wokingham Borough Council		Yes
Bracknell Forest Borough Council		
Surrey County Council	Yes	
West Sussex County Council	Yes	
East Sussex County Council		Yes
Medway Council	Some detail within Kent County Council and Medway Council's Energy and Low Emission Strategy	Yes
Kent County Council		
Hampshire County Council		Yes
Royal Borough of Windsor and Maidenhead		Yes
Isle of Wight Council		Yes

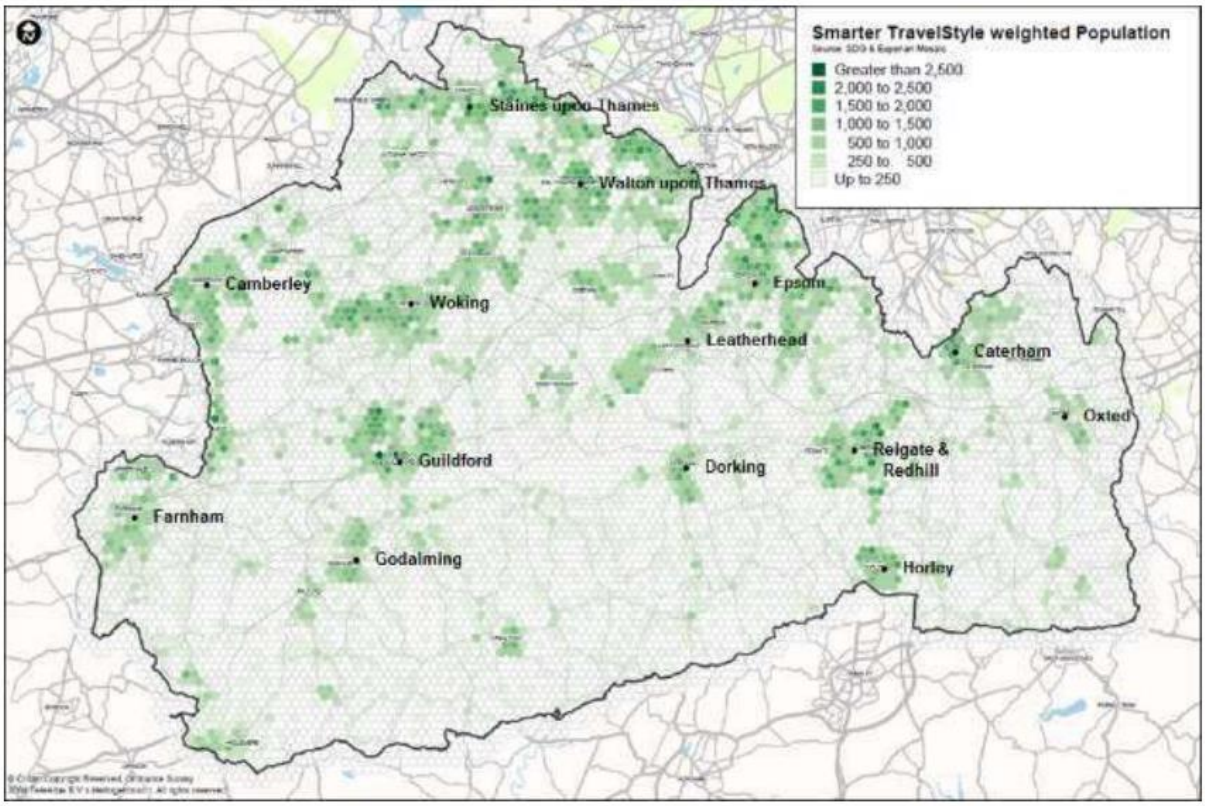
Surrey County Council Electric Vehicle Strategy (2018)

2.4.5 Surrey County Council's EV Strategy establishes the timeline below for delivering EVCI:

- By 2018, the council's on-street charging policy will be developed, and the council will lobby central government for funding.
- By 2019, the council will have informed geographical planning of EVCPs with funding for the installation and maintenance of charging infrastructure.
- By 2021, there will be EV use through Surrey's car club with a view to making 50% of available vehicles electric by 2025. In addition, the council will encourage EV adoption when fleet vehicles are refreshed.
- The council will provide ongoing information regarding EV technology, 'EV-friendly' planning policy, On-street chargepoints, encouraging the use of electric bikes and EV uptake by taxi operators, and providing further infrastructure on council land.

2.4.6 Figure 4 taken from Surrey County Council's EV Strategy, maps the areas identified as having greater propensity for EV uptake across the county.

Figure 4 EV uptake[25]



2.4.7 The strategy has an action for the development of a spatial plan to inform the rollout of EVCPs, and the council's on-street charging policy. Since the publication of the strategy, the council have developed a pilot project[26] to rollout on-street charging points in the west of the county.

2.4.8 The strategy also sets out the following actions in terms of electric chargepoints:

- A Strategic site assessment
- The council will review strategically located council owned sites for potential installation of rapid chargepoints for public use.
- Supporting a town centre charging network
- The council will work with boroughs, districts and other third parties to provide a network of chargepoints in town centre locations and key destinations.
- On-street chargepoint trials.

[25] Electric Vehicle Strategy, Surrey Transport Plan, Surrey County Council

[26] Surrey County Council, 'Electric Vehicle On-Street Charging Policy' (2021). https://www.surreycc.gov.uk/roads-and-transport/policies-plans-consultations/policies-and-plans/electric-vehicle-on-street-charging-policy

- The council will consider possible locations for a trial of on-street chargepoints at key destinations where parking pressures allow and where characteristics of the area suggest charging to be feasible.

West Berkshire Council Ultra-Low Emission Vehicle Strategy (2020-2030)

2.4.9 Predictions indicate that by 2030, 25% of West Berkshire residents will have transitioned to ULEVs. An estimated 31% of residential buildings in the district have no off-street parking, these residents will need to use on-street parking and public EVCPs. To combat this, the council's strategy includes commitments to help address the barriers to EV adoption, including:

- 50% increase by 2023 in the number of publicly available EVCP locations.
- 10% increase in number of ULEVs registered in the district by March 2023.
- 5% of all West Berkshire registered vehicles are ULEV by 2030.
- 25% of West Berkshire Council cars and light-duty fleet to be ULEV/BEV by 2022, with 100% ULEV/BEV by 2030.
- At least 60% of Car Club fleet vehicles EV by March 2022, resulting in expanding to at least 6 ULEVs by March 2022.

2.4.10 The ULEV strategy estimates that by 2030, West Berkshire will need sufficient EVCPs to satisfy demand of 2,000 daily charges for drivers without home charging (many homes within West Berkshire do not have capacity for off-street charging). This is split into the following needs:

- 33 rapid (22-150kW) EVCPs, accounting for 5% of users daily.
- 103 destination (7-22kW) EVCPs, accounting for 10% of users daily.
- 762 residential (7kW) EVCPs, accounting for 85% of users daily.

2.4.11 The strategy states that the council will concentrate on providing public chargepoints at council owned car parks, council buildings and staff parking as well as locations where households do not have off-street parking. The strategy further states the council will strengthen the guidance for EVCPs within new developments in the Local Transport Plan.

2.4.12 West Berkshire Council's ULEV strategy provides an overview of the commitments, quantified targets and ambitions within the strategy. Furthermore, baselining and forecasting has been undertaken to quantify the number of chargers needed within the Local Authority by 2030, as well as the charger type. The strategy does not, however, identify specific locations for the required chargepoints.

West Sussex County Council Electric Vehicle Strategy (2019-2030)

2.4.13 West Sussex County Council's EV Strategy establishes three aims, alongside supporting actions to help their realisation:

- Aim 1: At least 70% of all new cars in the county to be electric by 2030.
  - Supporting actions include:
    - Developing and starting delivery of a communication and engagement plan.
    - Exploring different charging mechanisms, including differential charges for residential parking permits for low emission vehicles. Furthermore, as charging point sites come forward, review the reducing parking fees in short- and medium-term parking locations.
    - Developing a phased fleet transition plan to move the council's fleet to electric.
- Aim 2: There is sufficient charging infrastructure in place to support the vehicles predicted to be reliant on public infrastructure to charge.
  - Supporting actions include:
    - Regularly reviewing the council's Guidance on Parking at new developments to ensure adequate provision for EV charging on new development. Revise WSCC's Local Design Guide to reflect our charging point principles. Revise new building design standards to include EV provision that meets the council's charging point principles. Lobby for more transparency from market providers regarding future development plans.
    - Collate a long list of sites for consideration for delivery by WSCC's delivery partner. Appoint a market-based partner to work with the council to provide the charging point network. Develop a 5-year rolling delivery programme for charging points across the County. This delivery programme will include measurable targets.

- Aim 3: Ensure a renewable energy source for all charging points on County Council land or highway.

- Supporting action:
  - Stipulate the requirement for renewable energy.

2.4.14 Modelling work estimates that 3,305 public chargepoints will be required by 2025 and 7,346 by 2030, as shown in Table 4.

Table 4 Forecasting results, high uptake scenario[27]

High Uptake Scenario: 70%

Number of EV's	Now	2025	2030
Total EVs in West Sussex car stock	1,593	66,236	161,583
Number of EVs that will rely on public infrastructure	<10	17,890	44,048
Number of publicly accessible residential charging points required	0 home specific 80 destination	3,169	7,027
Number of publicly accessible rapid charging points required	9	136	319

2.4.15 WSCC identify the following priorities for charging provision:

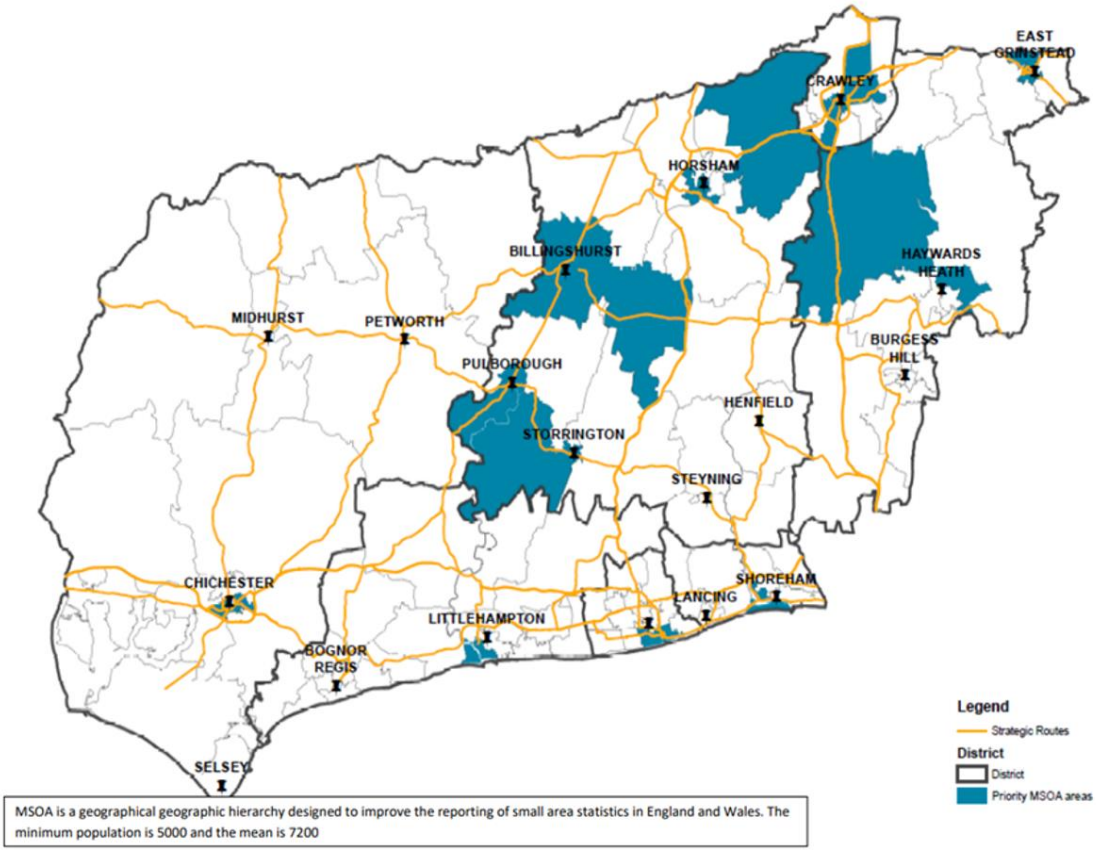
- Residential Charging – Where no off-street parking exists, WSCC want to enable 2, potentially 3 types of residential charging which include:
  - Enabling charging on home charging point,
  - Residential hubs
  - Residential charging on street.
- Rapid Hub Charging – to be at least 43kW AC or 50 kW DC and located in areas which don't experience congestion or attract additional trips.
- Destination Charging – to be installed where short/medium term parking is available including mixed use areas and destinations such as near high streets and transport hubs.

2.4.16 Connected Kerb, West Sussex County Council, Adur and Worthing District Councils, Arun District Council, Crawley Borough Council, Horsham District Council, and Mid Sussex District Council have formed a partnership to provide a new chargepoint network across West Sussex. The partners are working together to install thousands of chargepoints across the county within the next ten years, forming the new West Sussex Chargepoint Network.

[27] Source: West Sussex Electric Vehicle Strategy 2019 -2030

2.4.17 The WSCC strategy identifies priority locations for EVCI at Middle Super Output Area (MSOA) level, see Figure 5.

Figure 5 Priority areas for EVCP installation[28].



2.5 Other Local Transport Authority Policies and Strategies

2.5.1 The following section summarises the key EV uptake and charging infrastructure objectives, forecasts and commitments included in the 13 LTAs' wider policy and strategy documents, for example their Local Transport Plans and Climate Change Strategies. More detail is included in Appendix 2.

Bracknell Forest Council

Sustainable Modes Strategy (2018-2026)

2.5.2 Key targets, objectives and commitments include:

- Encouraging the use of cleaner and less polluting vehicles.
- Encouraging commercial EV charging operators to provide chargepoints in suitable locations. This includes at Council-owned facilities where practical, as well as supporting charging provision at business, leisure and retail destinations across the Borough.
- Continuing to apply a logical, yet supportive role in facilitating EV use.

Climate Change Strategy (2020-2024)

2.5.3 Key targets, objectives and commitments include:

- Pan-Berkshire EV project – The Council will be working with the other 6 Berkshire authorities to implement a comprehensive and strategic EV charging infrastructure network by 2030, ready for the end of sales of new petrol and diesel cars in the UK.

Brighton and Hove City Council

[28] West Sussex Electric Vehicle Strategy 2019 -2030

2030 Carbon Neutral Programme (2021-2030)

2.5.4 Key targets, objectives and commitments include:

- Promoting and facilitating the use of zero emission and electric vehicles, by installing hundreds of on-street electric charging points and rapid charging hubs for taxis.

Developing a new Transport Plan for Brighton and Hove (2021)

2.5.5 Key commitments, objectives and forecasts include:

- Promoting and facilitating the use of low and zero emission vehicles by:
  - introducing emissions-based parking charges.
  - expanding the Ultra-Low Emission Zone.
  - installing more electric vehicle charging points at homes and destinations.
  - offering financial incentives to switch to electric vehicles.
  - running behaviour change campaigns to switch to electric vehicles.
  - switching Council fleet and contractors to use zero emission vehicles.
  - using more electric shared transport vehicles.
  - introducing low emission bus corridors.

East Sussex County Council

East Sussex Environment Strategy (2020)

2.5.6 Key targets, objectives and commitments include:

- Developing and implementing an electric vehicle strategy for East Sussex.

East Sussex County Council's Climate Emergency Plan (2020-2022)

2.5.7 Key targets, objectives and commitments include:

- Reviewing grey fleet – Commission a review by the Energy Savings Trust (EST).
- Installing EVCPs - Identifying where to locate types and number of chargers, and delivery mechanism.

East Sussex Local Transport Plan (2011-2026)

2.5.8 Key targets, objectives and commitments include:

- Focusing on planning and technology to make best use of the existing transport network e.g., EVCPs.
- Encouraging and facilitating the use of alternative technologies (i.e., EVs).
- Considering the implementation of EVCI in the priority areas of the county.

East Sussex Local Transport Plan Implementation Plan (2016/17-2020/21)

2.5.9 Key targets, objectives and commitments include:

- Tackling climate change.
- Installing EVCPs at key locations in Bexhill, Hastings, Eastbourne and South Wealden, Lewes and South Downs National Park.

Hampshire County Council

Hampshire Carbon Mitigation Action Plan (2011-2031)

2.5.10 Key targets, objectives and commitments include:

- Pilot on-street residential EVCIs:
- Phase 1 pilot (Winchester and Eastleigh) - installing 50 on-street residential EVCPs complete (2020/21).
- Phase 2 pilot (Aldershot) being designed (progress subject to OZEV funding bid 2021/22)[29].

[29] Also stated in Hampshire Local Transport Plan (2011-2031).

Hampshire Climate Change Strategy (2020-2050)

2.5.11 Key targets, objectives and commitments include:

- Becoming carbon neutral by 2050.
- Building resilience to a two-degree rise in temperature.
- Enabling, supporting and delivering a reduction in transport-related carbon emissions and a resilient transport network.

Isle of Wight Council

Mission Zero Climate and Environment Strategy (2021-2040)

2.5.12 Key targets, objectives and commitments include:

- Reaching net zero by 2030 requires an average of 177 electric vehicles registered per week from April 2020 to December 2030.
- Reaching net zero by 2040, requires an average of 83 electric vehicles registered per week from April 2020 to December 2030.
- Ensuring the island can support increasing use, and encourage the switch to EVs. The council will increase the number of publicly available rapid charging and fast charging EVCPs across the island to at least 72 (council and supermarket car parks and petrol stations). This ensures one EV charger available per 8 households who don't have off-street parking by 2040.
- Phasing out the purchase of all new petrol and diesel vehicles for the council fleet by 2030 in line with new law in England.

Kent County Council

Kent County Council and Medway Council's Energy and Low Emissions Strategy (2020)

2.5.13 Key targets, objectives and commitments include:

- Reducing greenhouse gas emissions from their own estate and activities
- Progressing the development of their carbon reduction plans in relation to EVCI includes:
- Kent County Council leading a collaborative effort by six councils to install over 600 new charging points over the next 2 years.

Medway Council

Medway Climate Change Action Plan (2022)

2.5.14 Key targets, objectives and commitments include:

- Progressing the delivery of their EV strategy (2022-27) and facilitating the installation of EVCPs on council land and the public highway.
- Working collaboratively with public and private sector partners to identify key locations where charging points can be installed to facilitate the use of EVs, including taxi and private hire operators.
- Reviewing strategically located council owned sites for potential installation of rapid charging points for public use, current parking standards policies/arrangements, potential emission. reduction options for Refuse Collection Vehicle (RCV) fleet, staff parking provision, and transport provision policies.

Portsmouth City Council

Portsmouth Local Transport Plan (2021-2038)

2.5.15 Key targets, objectives and commitments include:

- Providing appropriate charging solutions to meet demand, such as those provided in the pioneering On-street Residential Chargepoint Scheme (ORCS).
- Introducing more off-street charging points into all council-owned car parks.
- Requiring EVCPs where car parking is provided in new developments.
- Partnership working with businesses and neighbouring authorities to ensure that there is a comprehensive network of EV chargepoints across the wider Solent region.

Reading Borough Council
Reading Climate Emergency Strategy (2020-2025)

2.5.16 Key targets, objectives and commitments include:
- Decarbonising the Council vehicle fleet by increasing EVCPs at Council buildings and a phased replacement of Council vehicles with electric powered units wherever possible.
- Increasing public EVCPs.
- Requiring all taxis and private hire vehicles to be electric or hybrid by 2030.
- Implementing a policy for appropriate provision of EVCPs across the borough by 2022.

Royal Borough of Windsor and Maidenhead
Environmental and Climate Strategy (2020-2025)

2.5.17 Key targets, objectives and commitments include:
- Increasing EV charging capability by identifying a partner and funding model to roll out EVCI required to meet carbon reduction targets.
- Adopting a new parking supplementary planning document (SPD) setting out standards for EV charging in new developments.

Slough Borough Council
Slough Low Emission Strategy (2018-2025)

2.5.18 Key targets, objectives and commitments include:
- Promoting and supporting the take-up of ULEV plug-in vehicles, including cars, taxis and commercial vehicles.
- Developing and implementing a Slough Electric Vehicle Plan. This will help:
  - Support home and workplace charging as the primary charging locations.
  - Ensure charging opportunities are available for residents with and without private driveways.
  - Install a network of rapid charging hubs to facilitate a high growth rate for plug-in taxis.
  - Use smart technology to link taxi operators with charging infrastructure and customers.

Southampton City Council
Connected Southampton Transport Strategy (2019- 2040)

2.5.19 Key targets, objectives and commitments include:
- Promoting and developing a Zero Emission City.
- Seeking to deliver a 24 hour publicly accessible network of EVCPs.
- Ensuring that there is provision for EV charging in new developments.

2.5.20 EVCP locations being considered in a first pilot phase includes Council-owned City Centre car parks, the Universities and at Southampton Central Station. Subsequent phases will focus on installing charging points in taxi ranks and neighbourhood ‘Mobility Hubs’ which can be accessed by fleet, employees or visitors.

Wokingham Borough Council
Local Transport Plan (2011-2026)

2.5.21 Key targets, objectives and commitments include:
- By 2026, aiming to have developed a network of EVCPs across the Borough.
- Strongly encouraging the development of infrastructure that will support green technology (e.g., EVCPs).
- Producing a policy that sets out a framework for the roll-out of EVCPs. The results of this study will inform recommendations into the planning process.

Summary

2.5.22 The LTAs who have not yet published an EV Strategy do all capture EV and climate change targets and commitments in other plans and strategies. For those that do have targets and commitments relating to EVCI, these are quite broad and not quantified. This reiterates the need for TfSE to develop a regional strategy to set direction, forecasts and an action plan to support each of the LTAs deliver their own EV/EVCI strategy. Analysis of the commitments relating to EVs, EVCIs, fleet for all the 16 LTAs is set out in Table 15 in Appendix 2.

2.6 District and Borough Authority EV Strategies

2.6.1 Desktop research shows the following EV or EVCI strategies have been produced by the district and borough authorities within the TfSE area:

- Swale Borough Council Draft Electric Vehicle Strategy 2022–2030.
- Waverley Borough Council Electric Vehicle Strategy 2021-2026.
- Horsham District Council Electric Vehicle Chargepoint Strategy.
- Sevenoaks District Council Low Emission and Electric Vehicle Strategy.

2.6.2 While most of these strategies describe current numbers of EVCP provision, few contain forecasts for EVCPs required in future (neither numbers nor locations). Summaries of these strategies are presented below, with more detail for each in Appendix 2.

Swale Borough Council Draft Electric Vehicle Strategy (2022–2030)

2.6.3 Swale Borough Council has set out five objectives within the Draft EV Strategy. The Council have also provided guidance on how these objectives are to be achieved. The five objectives are:

- Creating and facilitating a network of EVCPs that meets the needs of residents, businesses, and visitors, with sufficient coverage by 2030.
- Designing sites that take into consideration accessibility concerns and other road users/pedestrians.
- Ensuring the charging network has capacity for further expansion and is futureproofed.
- Encouraging uptake of EVs through education using campaigns, supporting trials, initiatives, and public engagement.
- Leading by example through use of electric vehicles wherever possible for delivering council services and promoting the benefits.

Waverley Borough Council Draft Electric Vehicle Strategy (2021-2026)

2.6.4 Waverley Council's strategy have includes a phased approach to encourage EV uptake. This is shown in Appendix 2. The Council makes three key commitments:

- EVCP installed in at least 30 different locations by 2026.
- At least 50% of all EVCPs to be supplied by renewable energy.
- All new taxi licences issued from 2023 must be ULEVs, and all taxis licenses operating to be ULEV by 2030.

Horsham District Council Electric Vehicle Chargepoint Strategy (2020)

2.6.5 In order to develop the EVCP network, Horsham District Council forecasted the required number of EVCPs for 2025 and 2030. The strategy sets out these objectives:

- Use council land effectively to support EVs.
- Support new buildings planning policies on EVs.
- Include EVCPs in council development.
- Take part in partnerships for a comprehensive and cohesive EVCP network.
- Provide incentives and promote EVs.

Sevenoaks District Council Low Emission and Electric Vehicle Strategy

2.6.6 Sevenoaks District Council set out the following actions:

- Promote low carbon travel.

- Improve the electric vehicle charging network across the district.
- Continue the transition to a zero-carbon emissions vehicle fleet wherever practicable.

3 DNO Strategy

3.1.1 The TfSE area is covered by two Distribution Network Operators (DNOs); UK Power Networks (UKPN) and Scottish and Southern Electricity Networks (SSEN), who have both produced electric vehicle strategies for their respective regions. The content of the strategies will help inform the regional TfSE strategy and action plan and ensure that as far as possible they are aligned. An overview of these two strategies is provided below:

UK Power Networks Electric Vehicle Strategy (May 2020)[30]

3.1.2 UK Power Networks Strategy has three key objectives:

- Inform investment and industry leading policies and standards which involves achieving the best forecasting tools to support planning, and ensuring technical standards are up to date, to produce clear and accessible policies and standards.
- Deliver great customer service which involves focusing on the customer experience and educating the market on the role of the network infrastructure to enable their connections. This is to be achieved by having the largest choice availability for customer convenience and continuing to engage and provide transparency of required data.
- Develop a network that is prepared for EV uptake through the use of smart solutions and strategic investment which involves having the network technically ready by using smart solutions and deploy efficient investment, scale and timed, to reach the required capacity.

Scottish and Southern Electricity (SSE) Networks Electric Vehicle Strategy (March 2020)[31]

3.1.3 SEN have identified five principles to support the transition to Electric Vehicles:

- Using data and analytics to anticipate issues, support decision making and make sure our networks are ready for EV uptake – This is to be actioned by making data available and transparent, determining current and future constraints through data analysis, giving decisions in real time, and using power flow analysis.
- Having a suite of tools available to support widespread EV uptake – This is to be actioned by using market-based flexibility to carry out smart charging, understanding the impact of tourism on EV uptake, utilising tools to facilitate Distribution System Operator (DSO) market flexibility and fleet electrification, and developing flexible connections.
- Using Local Development Plans to inform and establish strategic investment programmes – This is to be actioned by:
- having a clear plan agreed with Ofgem for strategic investment, focussing on acting before customer experience is affected.
- Forming strategic partnerships to coordinate charging infrastructure.
- Analytics and forecasts to determine when networks need investment.
- Proactively replacing cut-outs and shared service cables to make properties EV-ready.
- Using innovation, digitalisation, new skill sets and operational capabilities to meet the forecast growth – This is to be actioned by establishing appropriate resources to deal with impacts from increasing EV uptake expected on queries, quotations and site visits, electrifying SSEN fleets, improving IT/OT systems and use, and preparing for contingencies, such as carrying out pre-storm network configurations.
- Supporting stakeholder and customer ambitions to decarbonise – This is to be actioned by giving visibility of network capability, communicating with customers and stakeholders, and protecting vulnerable customers.

3.1.4 Both strategies highlight the DNOs commitments to support the development of local EVCI policies and roll-out plans by sharing data and models to inform decision making. Engagement with the DNOs is an essential element in the creation of the TfSE EVCI strategy.

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

[31] Scottish and Southern Electricity Networks, 'Electric Vehicle Strategy' (2020). https://www.ssen.co.uk/globalassets/electric-vehicle/ev-media/ssen-ev-strategy-september-2020.pdf

4 Market Trends and Challenges

4.1 Introduction

4.1.1 Market trends and challenges provide both context and input to the development of the TfSE EVCI strategy. This section describes technology, performance and commercial trends in the EV market, challenges (including uncertainty and pace of change) and the range of EVCP solutions, both available and emerging.

4.2 Current EV Market

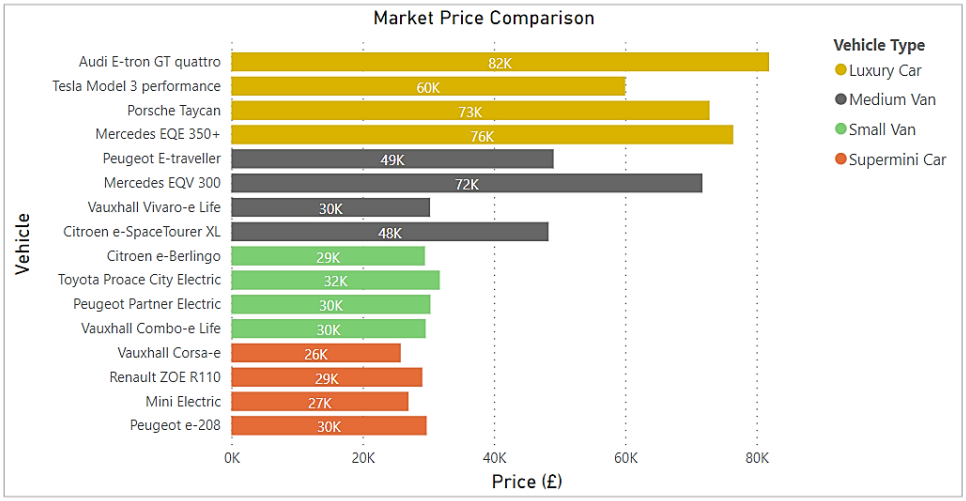
4.2.1 The current EV market is evolving with new, more efficient, and technologically improved models being released every year. In this section, a list of luxury cars, supermini cars, small vans and transit vans have been identified and characterised across a range of criteria to show differences across these four vehicle types.

Price

4.2.2 The rate of EV adoption is accelerating, linked to increases in EV battery size and range, as well as reductions in battery price and EV sale price. However, the 2022 energy crisis has caused EV charging prices to rise, which may in the short-term discourage potential EV adopters[32]. Furthermore, there is uncertainty surrounding the impact of the recent announcement that EV owners will have to pay vehicle excise duty (i.e. road tax) from 2025[33]. Consequently, the EV market is highly volatile and predicting future trends is particularly difficult.

4.2.3 Figure 6 shows that luxury cars have the highest market price, due to a combination of features, performance and brand value. This is followed by medium vans, with the Mercedes EQV 300 being an anomaly due to it being produced by Mercedes who usually produce luxury vehicles. The small van segment follows next, with the supermini car being the most affordable category.

Figure 6 A market price comparison of electric vehicles[34]



Battery Range

[32] WhichEV, 'Public EV charging prices increase 14% since June according to Zap-Map' (2022). https://www.whichev.net/2022/11/14/public-ev-charging-prices-increase-14-since-june-according-to-zap-map/#:~:text=The%20price%20EV%20drivers%20are,charge%20points%20in%20the%20UK.

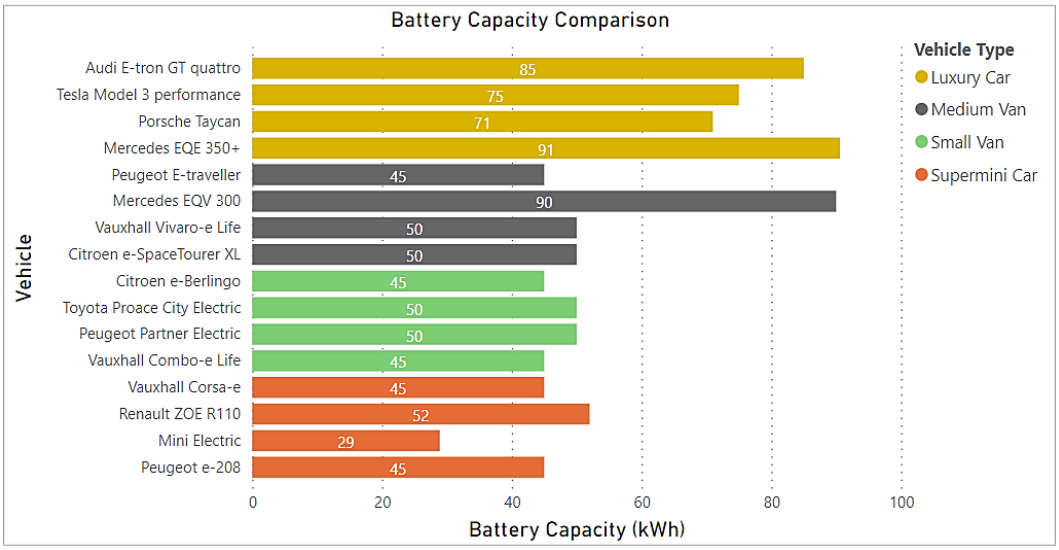
[33] The Guardian, 'Electric car owners to pay road tax from 2025, Jeremy Hunt announces' (2022). https://www.theguardian.com/uk-news/2022/nov/17/electric-car-owners-to-pay-road-tax-from-2025-jeremy-hunt-autumn-statement

[34] Electric Vehicle Database, 'Recently added electric vehicles'. https://ev-database.uk/compare/newest-upcoming-electric-vehicle#sort:path~type~order=.id~number~desc|range-slider-range:prev~next=0~600|range-slider-towweight:prev~next=0~2500|range-slider-acceleration:prev~next=2~23|range-slider-fastcharge:prev~next=0~1100|range-slider-eff:prev~next=150~500|range-slider-topspeed:prev~next=60~260|paging:currentPage=0|paging:number=9

4.2.4 In 2020, Castrol published a report suggesting that the 'tipping point' for switching to an EV, for most motorists in the UK, is based on a driving range of 285 miles. The weighted average range for all models available in 2020 is 220 miles[35], with some high-performance cars exceeding 375 miles. As technological advances in battery size and range continue, the frequency of needing to recharge reduces, increasing the confidence to travel further distances. This also minimises the level of behaviour change for the average driver, as 'range anxiety' is limited. Despite promises of EVs with a range of 500+ miles, ranges will not rise indefinitely as sheer battery size and associated expense will become a limiting factor.

4.2.5 The luxury car sample in Figure 7 have the highest battery capacity (except for the Mercedes EQV 300). However, medium and small vans sometimes offered two battery capacities options of around 50kwh and 75kwh. The category with the smallest battery capacity was the supermini car, as expected due to it being the smallest vehicle.

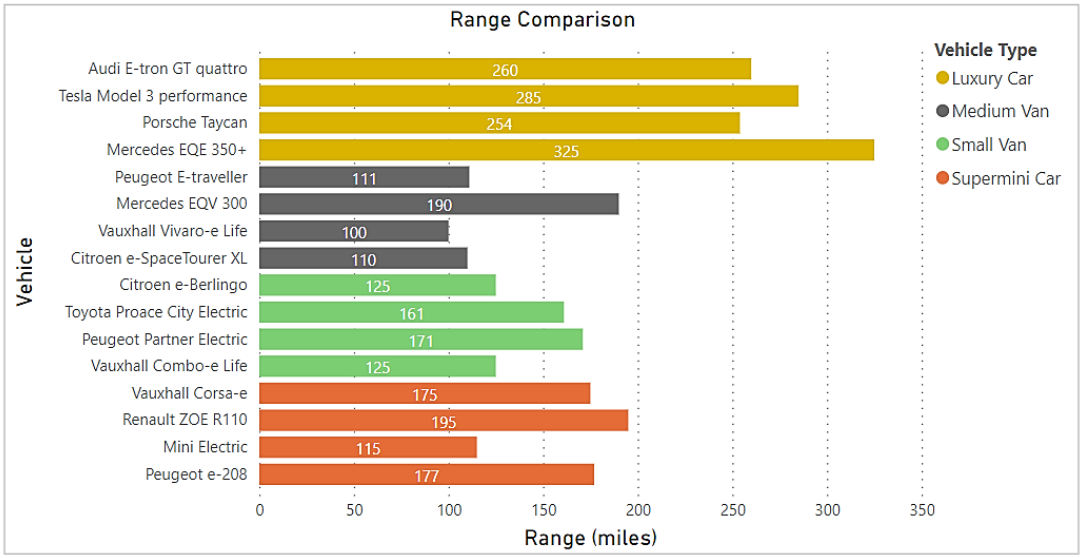
Figure 7 Battery capacity comparison of electric vehicles36



4.2.6 Figure 8 shows the driving range was between 100 miles and 325 miles for all EVs in the sample. The luxury car category had the highest driving range, a feature that contributes to it also being the category with the highest market price.

[35] IEA, 'Global EV Outlook' (2021). https://www.iea.org/reports/global-ev-outlook-2021
[36] Electric Vehicle Database, 'Recently added electric vehicles'. https://ev-database.uk/compare/newest-upcoming-electric-vehicle#sort:path~type~order=.id~number~desc|range-slider-range:prev~next=0~600|range-slider-towweight:prev~next=0~2500|range-slider-acceleration:prev~next=2~23|range-slider-fastcharge:prev~next=0~1100|range-slider-eff:prev~next=150~500|range-slider-topspeed:prev~next=60~260|paging:currentPage=0|paging:number=9

Figure 8 Range comparison of electric vehicles[37]

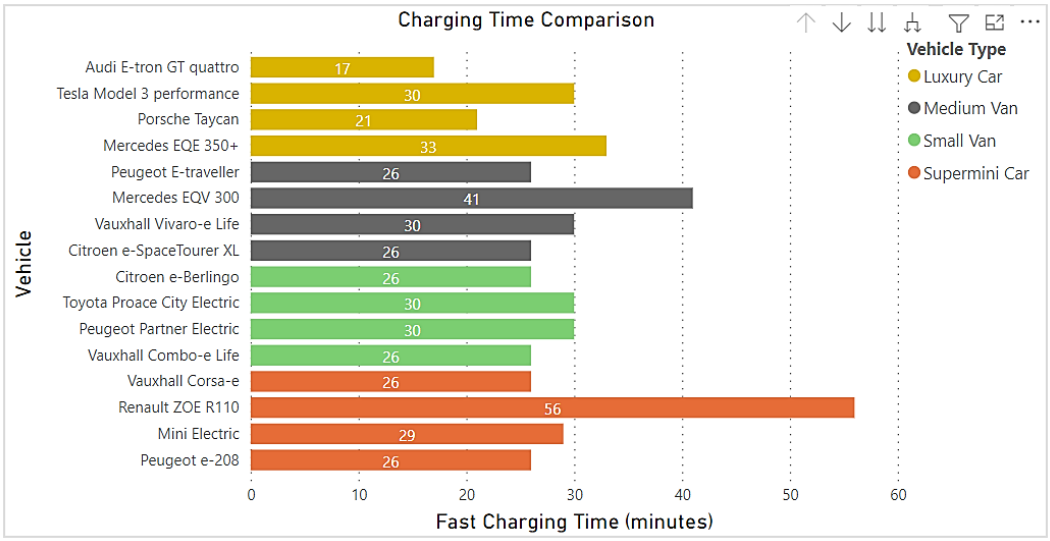


Charging Speed

4.2.7 The State of Charge (SOC), or percentage of the battery's full charge has a significant effect on the maximum power and hence time to charge. When batteries are nearly empty and have a low SOC, maximum charging can normally occur. However, as the battery charge increases, the charging rate tails off. However, some newer EVs, while able to charge at much higher power levels, may only sustain the highest charge rates across a smaller SOC range. While we expect that battery EV charging capability will further improve in the future, our research shows that maximum power levels of up to 150kW are likely to be sufficient for most EV models.

4.2.8 Figure 9**Error! Reference source not found.** shows the 'fast charging' time for each model. The times for all vehicle type categories are similar (with some outliers); charging time is largely depended on the make and model rather than the category.

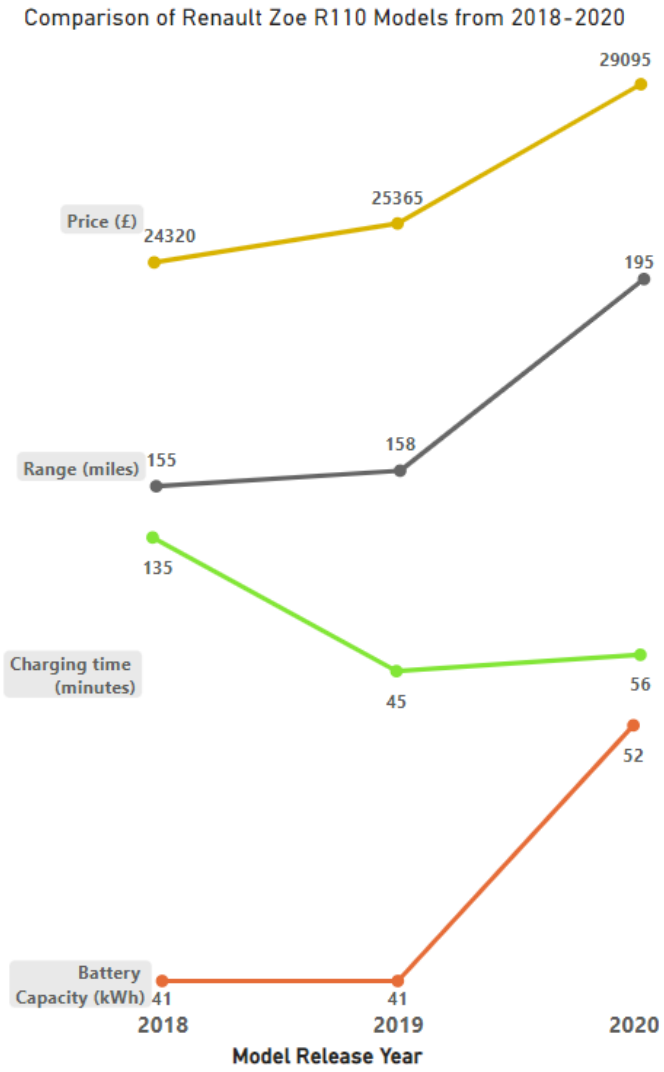
Figure 9 Fast charging time comparison of electric vehicles



[37] Electric Vehicle Database, 'Recently added electric vehicles'. https://ev-database.uk/compare/newest-upcoming-electric-vehicle#sort:path~type~order=.id~number~desc|range-slider-range:prev~next=0~600|range-slider-towweight:prev~next=0~2500|range-slider-acceleration:prev~next=2~23|range-slider-fastcharge:prev~next=0~1100|range-slider-eff:prev~next=150~500|range-slider-topspeed:prev~next=60~260|paging:currentPage=0|paging:number=9

4.2.9 Analysis of an EV model (Renault Zoe R110) in Figure 10 shows trends in price, range, charge time and battery capacity.

Figure 10 Comparison of Renault Zoe (R110) variants over time[38]



4.2.10 Figure 10 shows there is a progressive increase in EV battery capacity and range with a significant reduction in charging times due to improvements in EV charging technology. The charging time increased from 45 minutes in 2019 to 56 minutes in 2020 due to the increase in battery capacity and not due to any reduction in charging speeds.

4.2.11 Due to economies of scale, as well as battery technology improvements, EV costs are expected to fall in the long-term. However, in the short term, global supply chain issues, and rising commodity costs have led to an increase in EV battery costs for the first time since 2010[39].

4.2.12 Cost of EVs is currently one of the biggest barriers limiting widespread EV uptake, with global supply chain issues cited as the root cause.

4.2.13 In 2020, EV sales rose by 43% against 2019[40] and analysts predict a continuation in this trend of increased EV adoption if EV battery prices can continue to fall. However, drivers switching to EVs are waiting on average around eight months before they receive the vehicle[41]. These lead times present a challenge as it limits EV uptake due to lack of accessibility and convenience.

[38] Electric Vehicle Database, 'Recently added electric vehicles'. https://ev-database.uk/compare/newest-upcoming-electric-vehicle#sort:path~type~order=.id~number~desc|range-slider-range:prev~next=0~600|range-slider-towweight:prev~next=0~2500|range-slider-

4.3 Market Challenges

4.3.1 Analysis of market trends reveals a range of challenges for LTAs seeking to promote EV uptake and deliver an EVCI network to meet future demand. These challenges are shown in Figure 11.

Figure 11 Market challenges

4.4 Current EV Charging Technology

4.4.1 The following section describes the EV charging technology currently available in the market. The UK promotes the following standard terminology when referring to EVCPs to avoid confusion:

- EVCP/charging unit – a single upstand or wall-mounted structure offering one or more socket outlets or tethered plugs suitable for charging EVs.
- EV charging station – a site with at least one EVCP as well as additional energy supply enclosures (feeder pillars), weather shelters, signage, and protection barriers.

4.4.2 The main types of EVCPs, typical use cases, charging times and cost to charge[42] are summarised in **Error! Reference source not found.**:

acceleration:prev~next=2~23|range-slider-fastcharge:prev~next=0~1100|range-slider-eff:prev~next=150~500|range-slider-topspeed:prev~next=60~260|paging:currentPage=0|paging:number=9

[39] Statista, EV Battery Prices (2021). https://www.statista.com/chart/7713/electric-car-battery-prices/

[40] EV Volumes: https://www.ev-volumes.com/

[41] Electrifying, How to beat the queue for a new electric car (2022). https://www.electrifying.com/blog/article/waiting-times-for-electric-cars

[42] PodPoint, 'Cost of Charging an EV' (2022). https://pod-point.com/guides/driver/cost-of-charging-electric-car

Table 5 Types of current EV chargers.

Charger Type	Typical Use Case	Power	Typical Charging Time	Cost of charge	Remarks
Slow	Residential	3.6 kW AC	6-12 hours	£5-15	Charging time is for a full charge. Slow charging is equivalent to charging via a mains socket.
Fast	Destination	7 kW – 22 kW AC	3-6 hours	£22	Charging time is for a full charge.
Rapid	Destination & Strategic Road Network	43 kW AC, 50 kW DC, 120 kW DC	20 minutes – 1 hour	£27.50	Charging time is to charge to 80% after which the unit's power output will reduce to preserve battery life.
Ultra-Rapid	Strategic Road Network	150 kW DC	10 – 20 Minutes	£32.50	Due to the high current this charging method incurs, many older vehicles cannot handle the thermal impacts on the battery. This form of charging is thus suitable for HGVs and modern vehicles with larger battery capacities.

4.4.3 The cost to charge increases significantly as higher power chargers are used. These costs are highly dependent on energy costs and have increased due to the current energy crisis. Some public CPOs briefly charged £1 per kWh in 2022 for a rapid charger[43], before public pressure reversed this rise. Despite this, charging an EV is still cheaper than refuelling a petrol or diesel vehicle. Several price comparison calculators are available to quantify this exact savings and research suggests that the average driver could save over £500 per year in fuel costs[44]. This fuel saving is for an EV owner who charges at home, they will pay 11p / mile compared to an ICE vehicle costing 17p/mile[45].

4.4.4 The cost of EVCP hardware is one element of the total EVCI installation costs. Electrical infrastructure, planning and design, construction, and DNO connections all contribute to the total cost of installation. EVCI with higher power requirements will typically cost more and take longer to deliver. This is because more electrical infrastructure (e.g., transformers, substations), design work, and DNO support (e.g., to supply power to the site) is required. Table 6 presents the guidance produced by UK Power Networks, with indicative DNO connection costs for different EVCI installations[46].

[43] FleetNews, 'Energy cost rise increases rapid charging rate by 50%' (2022). https://www.fleetnews.co.uk/news/latest-fleet-news/electric-fleet-news/2022/09/15/energy-cost-rise-increases-rapid-charging-to-1-per-kwh
[44] ZapMap, 'Charging on the public network' (2022). https://www.zap-map.com/charging-price-index/
[45] ZapMap, 'Charging on the public network' (2022). https://www.zap-map.com/charging-price-index/
[46] UK Power Networks, 'Electric Vehicle Scenario Guide' (2020) https://media.umbraco.io/uk-power-networks/xqbp5u1p/ev-scenarios-may-2020.pdf

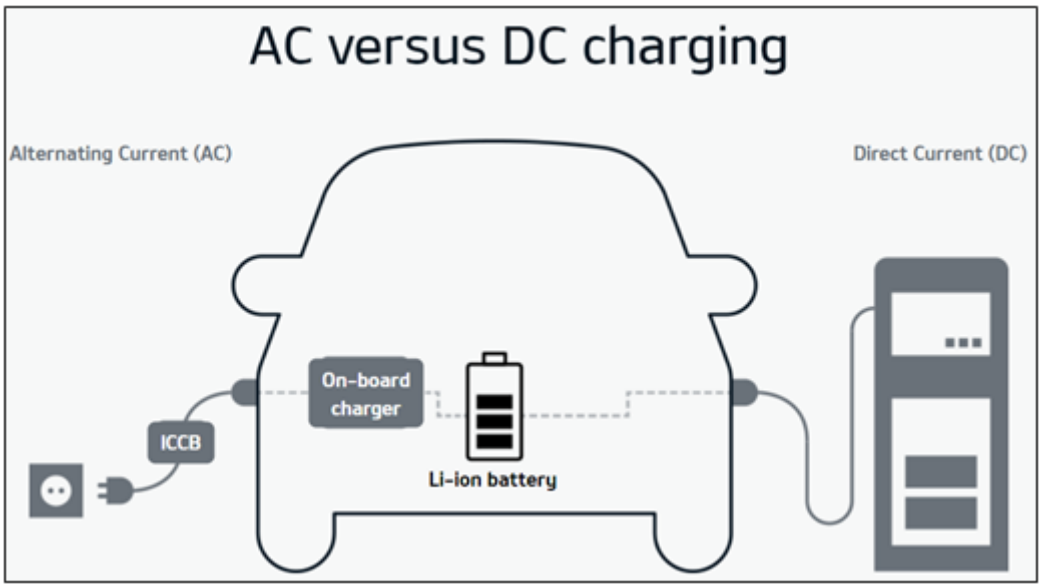
Table 6 Installation costs of different types of chargepoints.

	DNO Cost	Time to Deliver	Space Requirements
Installing a charger to an existing streetlight	N/A	Quick	Minimal
Installing an on-street charger	£5k - £10k	8-12 weeks	Small
Installing a charger at a car park	£10k+	8-12 weeks	Medium (2m x1m)
Installing multiple 150KW rapid chargers	£100k+	12-16 weeks	Large (minimum 5mx4m)
Installing 10 x 150kW rapid charger (1.5 – 2MVA)	£150k	16 weeks+	Large (x2) (minimum (x2) 5mx4m)
Installing 15+ 150kW rapid chargers (2 – 5 MVA)	£400k	20 weeks+	Large (x2) (minimum (x2) 5mx4m)

Direct Current (DC) Charging

4.4.5 Concerns over recharge times become increasingly relevant as EV ownership rises. Direct Current (DC) charging is one option for reducing charging times and improving the experience of using an EV. Despite DC chargers being larger and more expensive, they can achieve much higher power levels than Alternating Current (AC) charging, achieving a much faster charge time for users. The difference between AC and DC charging is that AC charging requires power drawn from the grid to be converted within the vehicle itself via an onboard charger, since an EV battery itself can only store power as DC. Whereas DC charging has a converter built into the charger itself which can feed power directly to the EV battery. A visual example of both AC and DC charging is presented in Figure 12 below.

Figure 12 AC vs DC charging



4.4.6 Most new EVs are compatible with combined charging system (CCS) connectors that can provide 50kW DC as well as 7-22kW AC. These are becoming the most common type of chargers for public chargepoints.

4.4.7 DC charging can also utilise power electronic devices such as voltage boosters to reduce the requirements from the grid whilst achieving high power levels to charge EVs quicker. The charging technology referred to as Ultra-Rapid or Hyper charging is where the EVCP can have a power output between 150kW-350kW. Ultra-Rapid chargers present an opportunity to significantly reduce EV charging times.

On-Street Electric Vehicle Charging Solutions

4.4.8 The provision of home-charging solutions is essential to meet the demands of current EV charging behaviour, ensure inclusive provision of EVCI and maximise accessibility across the region. This will ensure that users have the ability and confidence to charge their EVs, which in turn will promote EV adoption.

4.4.9 In recent years, public policy and funding opportunities have been focussed on the provision of EVCI for those with access to dedicated off-street parking, such as the OZEV EV Home Charge Scheme which covers up to 75% of the eligible costs of a EVCP and its installation (capped at £500, including VAT).

4.4.10 Research carried out by Element Energy showed that approximately 75% of all charging events occur overnight at home[47]. This highlights the importance of charging provision at residential locations. However, 60%[48] of homes in the UK do not have access to a private driveway to park their vehicle overnight (e.g terraced housing, tower block flats, apartment buildings). In these situations, EV users would find it more difficult to install private residential EVCPs and would instead be more reliant on on-street or community hub EVCPs, or workplace / destination charging.

4.4.11 Research shows that on-street EVCPs could facilitate approximately 48%[49] of all private EV charging events. For this reason, establishing an extensive residential EVCI network in the TfSE area will be essential to ensure inclusive access to EVCI and supply future demand across the region. It will provide potential EV users with confidence in the availability of EVCI, which in turn will promote EV adoption.

4.4.12 Unlike off-street, installation of EVCI on-street presents the following additional challenges and considerations:

- Residents will be impacted by EVCI installed outside their homes, therefore public consultation is especially important to avoid potential push back and potential reputational damage.
- There should be minimal additional street furniture – so called ‘street clutter’ has been shown to be unpopular among residents.
- Pavements must be wide-enough (at least 1.2 meters) so that infrastructure can be installed without impacting accessibility (e.g. wheelchair users).
- Usage and payment accessibility must be considered for all user groups.
- Infrastructure or design must be robust against vandalism and accidental damage (e.g., bollards).
- EVCPs should be located within a 3-minute walk from EV users’ homes’ to be used regularly.
- Street work licenses and traffic regulation orders must be considered as they can result in overall time cost implications, enforcement and consultation.
- The physical environment, hardware and user experience must also be considered regarding accessibility in accordance with the new PAS 1899:2022 standard[50].

4.4.13 It is important to understand the advantages and disadvantages of different types of EVCP, as different options may be better suited for a particular location. Streetscape, restrictions on parking bays, and other environmental factors must be considered to ensure the most accessible and convenient EVCP is installed. The different types of EVCP are described below in Table 7, along with the advantages and disadvantages of each.

[47] Element Energy, ‘EV Charging Behaviour Study’ (2019). http://www.element-energy.co.uk/wordpress/wpcontent/uploads/2019/04/20190329-NG-EV-CHARGING-BEHAVIOUR-STUDY-FINAL-REPORT-V1-EXTERNAL.pdf
[48] Office for National Statistics, ’Over half of younger drivers likely to switch to electric in next decade’ (2021) https://www.ons.gov.uk/economy/environmentalaccounts/articles/overhalfofyoungerdriverslikelytoswitchtoelectricinnextdecade/2021-10-25
[49] The Energy Saving Trust, ‘Charging Electric Vehicles’ (2019). https://energysavingtrust.org.uk/sites/default/files/23465-EST%2BDFT-Charging%20Electric%20Vehicles%20-%20Best%20Practice%20Guide-WEB.pdf
[50] Urban Foresight, ‘Guidance On Improving Electric Vehicle Charging Infrastructure’ (2021). Plymouth-Accessibility_v3.pdf (urbanforesight.org)

Table 7 Advantages and disadvantages of EVCP technologies

Type of EVCP	Advantages	Disadvantages
Lamppost Mounted EVCPs 	• Utilise existing physical and electrical infrastructure. • Avoids issues with surrounding accessibility and street clutter.	• Often discreet with minimal signage, there is an increased risk that parking bays may be taken by non-EVs, blocking access to the EVCP. • Long time to charge. Constrained by the existing power supply to the lamppost which is often less than a slow (3.7kW) EVCP. • Lampposts situated at the back of the footway can create a trailing cable trip hazard.
Bespoke EVCPs 	• Ability to use recycled street furniture, such as bollards and signposts, which reduces costs, street clutter, and the embodied carbon. • Have low power requirements and can be connected to existing infrastructure with minimal power reinforcement. • Quick installation - can be completed in a matter of days. • Low capital costs, further reduced through government funding (e.g., ORCS) and private operator agreements.	• May require new physical infrastructure to house the electronics. • Requires new electrical connections. • Additional civils work to install. • Reduces width of footway and accessibility.
Bollard Chargers 	• Maximum protection against damage and vehicle collisions. • Newly installed power connections can ensure that EVCPs can supply multiple charging sockets. • Can be future proofed by providing excess capacity to later supply additional or higher power EVCPs for future demand	• New electrical connections will be required, increasing installation costs and time. • Requires additional civils to install such as trenching, feeder pillars and associated traffic management. • Additional street clutter.

Type of EVCP	Advantages	Disadvantages
Pop-up Column EVCPs 	• When not in use, has minimal visual impact and no reduction in footway width. • Can be future proofed by providing excess capacity to supply additional or higher power EVCPs. •	• New electrical connections will be required. • Requires additional civils. • Can be difficult to locate. • Reduces width of footway when in use, reducing accessibility.
Chargepoints Installed on a Build-out 	• Does not impact accessibility as the buildout doesn't reduce the size of the footway. • Newly installed power connections can ensure that EVCPs can supply multiple charging sockets. • Can be future proofed by providing excess capacity to later supply additional or higher power EVCPs.	• New electrical connections will be required. • Increased civils required to install into the carriageway. • Reduces parking availability.
Wireless Charging 	• Automated and hands-free – providing the highest levels of safety, convenience and accessibility. • Minimal additional street furniture and impact on accessibility.	• Costly installation and high procurement costs for the hardware. • Current vehicle technology does not enable wireless charging without adaptation and there is uncertainty over the ability to retrofit. • Certain vehicles would require major redesign to ensure ground clearance.
Chargebridge EVCP 	• An innovative on-street solution that avoids EV charging cables obstructing footways entirely. • The system can be installed on dense terraced streets using existing lampposts or being connected to properties. • Home, on-street, residential, and workplace charging applications.	• The system is in early stages of development and not yet available for commercial roll-out. • The solution is currently untested on a large scale. • May not be suitable for areas of high parking demand due to difficulties accessing the charger.

Case Study: Brighton and Hove City Council

Brighton and Hove City Council have taken a lead in EV infrastructure rollout in the TfSE region. Over 350 chargepoints have been installed with funding provided by OZEV, and investment from Electric Blue who were chosen to install, maintain and manage the chargepoints. This is to align with obligations set out in the Oxford's City Council's Charter for cleaner air, which Brighton and Hove Council have signed to call on the UK Government to put air quality as a priority. The Charter also results in the chargepoint operator, Electric Blue, using 100% renewable electricity tariffs. Residents and visitors can find the nearest chargepoints on the Electric Blue app. Charging costs 39p per kWh, with the council receiving 1p per kWh in year one, rising to 4p per kWh in year four. All chargepoints are fed by 100% renewable energy. Brighton and Hove have implemented parking restrictions to promote EV uptake. The council offers a 50% discount for resident parking permits for eligible low emission vehicles and 18 mandatory rapid EV vehicle recharging parking bays have been marked across the city. Brighton and Hove have also taken into consideration taxi driver EV uptake, offering three rapid taxi charging hubs. To increase inclusivity in EV uptake, Brighton and Hove City Council have also started a new project to soon trial EVCPs designed to be accessible for disabled people, working with Electric Blue, and Disabled Motoring UK.

This case study came from the Parking Strategy and Contracts Manager at Brighton and Hove City Council.

Case Study: Bracknell Forest

In partnership with EV charging infrastructure designers and installers, Joju Charging and their funding partner and chargepoint operator, Mer UK, Bracknell Forest Council is installing 32 charging points in 11 car parks. The 22kW chargers are open for all to use, including residents without off-street car parking living nearby. The type 2 chargers cost £0.39/kWh and payment can be made via the Mer UK app, or by following the instructions on the chargepoint.

The source for this case study is https://www.bracknell-forest.gov.uk/news. References to prices per kWh were correct at the time the article was written.

Best Practice: Inductive Charging for Taxis in Nottingham (WiCET)[51]

Nottingham City Council has unveiled five wireless charging pads along the Trent Street taxi rank with nine council owned electric taxis fitted with receivers.

The taxis are available for loan on a free trial basis to licensed taxi drivers to experience the technology first-hand.

The council secured £930,000 from the Government's Office for Zero Emission Vehicles (OZEV) through Innovate UK for the WiCET project. The project involved London Electric Vehicle Company (LEVC) and Nissan Dynamo electric taxis.

[51] Transport Nottingham, 'Wireless Charging of Electric Taxis (Wicet) (2022). https://www.transportnottingham.com/projects/wicet/

5 Public and Private Operating Models

5.1.1 This section describes the business operating models, which include the procurement, installation, operation and maintenance of EVCPs. These operational models can be complex and due to the on-going technology development, there are several different bespoke methods and models available.

The typical public and private operating models are summarised in Table 8

5.1.2 Table 8 Typical operating models, below:

Table 8 Typical operating models

	LTA Own and Operate	LTA Led Private Operated	Hybrid	Fully Funded Concession Contract	Private Own Operated
Supply of Land	LTA	LTA	LTA	LTA	Private
EVCP Cost	LTA	LTA	LTA	Private	Private
Installation	LTA	LTA	Private	Private	Private
Maintenance	LTA	Private	Private	Private	Private
Revenue Risk	LTA	Mixed	Private	Private	Private

5.1.3 These operating models have been used by LTAs in the TfSE area. For example, West Sussex County Council have used a fully funded concession contract which means they do not incur any installation or maintenance costs. TfSE can help gather and disseminate lessons learned from the LTAs, district and borough authorities. TfSE can support LTAs in selecting an operating model that appropriately balances the risks and rewards of EVCI. This can include developing a framework that will provide guidance on each model and when they are most appropriate.

5.1.4 Private sector funded operating models can be secured via the development process. Planning and related policies can be developed and used by LTAs to ensure that EVCPs are integrated within new developments from the design stage. This ensures that chargepoints are conveniently placed and are less expensive and disruptive than installing chargepoints at a later date[52].

[52] Energy Saving Trust, 'Incorporating EV chargepoints into local planning policies for new developments' (2020). https://energysavingtrust.org.uk/wp-content/uploads/2020/10/EST0013-Local-Authority-Guidance-Document-Incorporating-chargepoints-into-local-planning-policies-WEB.pdf

5.1.5 The advantages and disadvantages of each of the typical operating models are explained in Table 9.

Table 9 Key points of each model type.

Model type	Advantages	Disadvantages
LA Own & Operate	• Charging infrastructure assets owned and operated by LA. • LAs have control over EVCPs e.g., location and pricing. • LAs receive all revenue generated.	• This can be a higher-risk and higher-cost option for LAs due to taking on the responsibility for ongoing maintenance. • This may require helpline support for the chargers.
LA Led & Private Operated	• LA only has to cover capital costs of installation, which can be heavily subsidised through government capital funding. • LA retains ownership of the assets while passing operational risks to the private organisation. • Revenue sharing can be built into contracts with the operator.	• LA must pay a fee or agree revenue share with the private company operator. • LA will still be responsible for covering any major upgrades or network costs. • Convenience of outsourcing responsibilities comes at a cost higher than it would if the EVCP was LA operated.
Fully Funded Concession Contract / Hybrid	• Private operators cover all the capital and operating costs of the project and taking on the operating risks. • Low upfront costs for LAs while keeping a degree of control over operation.	• The LA has limited ownership of the assets. • LA must be willing to hand over public land to private organisations.
Private Own & Operated	• EVCPs installed and operated at minimal upfront costs to the LA. • No operational risk to the LA.	• LA has limited control over EVCP which could lead to issues surrounding inflated charging costs and maintenance issues.

6 Funding

6.1.1 Government grants, end user charges and private funding are all options that can be explored to either fund or recover capital costs for installing EVCI. The private sector CPOs have also invested in the UK's EVCI with a business model focused on revenue returns through charged usage.

6.1.2 The Office for Zero Emission Vehicles (OZEV) offers a range of grants, incentives, assistance, and funding to help people make a switch to EVs. LTAs can also seek funding from OZEV. **Error! Reference source not found.** sets out the current funding available.

6.1.3 The **Rapid Charging Fund (RCF)** was announced in the March 2020 Budget as part of a £950 million fund. This fund is to future-proof electrical capacity at motorway and major A road service areas to prepare the network for 100% zero emissions vehicles (ZEV) uptake. It will fund a portion of the costs at strategic sites in cities and rural areas across the strategic road network where the costs of upgrading sites to meet future charging demand are not commercially viable. It is also helps businesses with the costs of connecting high-powered chargepoints to the electricity grid, where those costs would prevent private sector investment.

6.1.4 The £450 million **Local EV Infrastructure Fund (LEVI)** is another fund launched in the financial year 2022 to 2023, that will help local authorities leverage private sector investment into their local charging networks and roll out long-term, sustainable EV charging infrastructure. A £20 million pilot was launched in 2022 to support local authorities in the delivery of chargepoint infrastructure. The pilot is backed by £10 million of government funding shared among the 9 winning local authorities in the first tranche of the planned £450 million scheme, with winning pilot bids supported by an additional £9 million in private funding. A further £1.9 million will come from public funds across local authorities. Kent County Council is planning installation of 26 chargepoints using this funding[53]and West Sussex has secured £2.9 million in the second phase of pilot funding[54]..

On-Street Charging

6.1.5 The **On-Street Residential Chargepoint Scheme (ORCS)** gives local authorities access to grant funding that can be used to part-fund the procurement and installation of on-street EV chargepoint infrastructure for residential needs which align with minimum installation and equipment requirements. The new LEVI fund builds on the success of the On-Street Residential Chargepoint Scheme (ORCS) and growing demand from local authorities, with a further £10 million in funding brought forward for this year, bringing this year's ORCS funding to £30 million to help maintain ongoing installations (2022-23).

6.1.6 The amount of available funding has increased throughout the life of the scheme. In the 2019-20 financial year, £5 million of funding was issued to 46 local authorities and in 2020-21 there was £20 million available[55]. Over 1,000 on-street chargepoint applications have been approved in the South East region[56].

6.1.7 Amendments have been made to the scheme to ensure more local authorities benefit from the funding, improve the consumer experience of charging and allow for chargepoint installations on more types of suitable land. From April 2022, the scheme has changed to provide up to a maximum of 60% (from 75% prior to 2022) of project capital costs.

6.1.8 The fund will provide up to £7,500 per chargepoint unless electrical connection costs are exceptionally high. If they are, then funding up to £13,000 per chargepoint may be provided. Chargepoints may be installed on land not owned by the local authority. OZEV approved chargepoints are eligible for the EVCP grants and the workplace charging scheme.[57]

[53] Department for Transport, 'Officer for Zero Emission Vehicles and Trudy Harrison MP' (2022). Drivers to benefit from £20 million EV chargepoint boost - GOV.UK (www.gov.uk)
[54] Department for Transport, £56 million of public and industry funding electrifies chargepoint plans across the country - GOV.UK (www.gov.uk)
[55] Energy Saving Trust, 'On Street Residential Chargepoint Scheme' (2020-2021) https://energysavingtrust.org.uk/sites/default/files/ORCS%20Info%20Pack%2020-21%20V7.pdf
[56] Gov.uk, 'Electric vehicle charging device grant scheme statistics: October 2022' (2022). https://www.gov.uk/government/statistics/electric-vehicle-charging-device-grant-scheme-statistics-october-2022
[57] Office for Zero Emission Vehicles, 'Grant schemes for electric vehicle charging infrastructure' (2022). https://www.gov.uk/government/collections/government-grants-for-low-emission-vehicles

Off-Street Charging

6.1.9 From April 2022, the Electric Vehicle Homecharge Scheme (EVHS) was replaced with the **EV chargepoint grant** which supports homeowners living in flats, renters (flats and single use properties) and landlords.

6.1.10 As part of the replaced EV chargepoint grant, the Government offers a grant to landlords for single use, multi-use and commercially let properties that have parking dedicated for staff or fleet use of the tenant or prospective tenant. This funds a maximum of £350 per OZEV approved chargepoint socket installed. This grant is also open to people who live in rental accommodation or own a flat.

6.1.11 The Government has opened the **EV infrastructure grant** for residential car parks, which is intended for entities that rent, lease or manage residential properties who want to install EV chargepoints. This is only available to multi-unit residential properties with a car park of a least 5 parking spaces. Applicants can receive up to 30 grants per year, each grant relating to a different property and is up to £30,000. The grants are £500 per parking space for charging infrastructure and £350 for a chargepoint.

Workplace Charging

6.1.12 **The Workplace Charging Scheme (WCS)** provides funding towards the cost of the purchase and installation of EVCPs at workplaces. The scheme can be applied for by any eligible business, charity or public sector organisation. There is further guidance (published in March 2022) which is for charities and accommodation businesses. The Government will continue to fund the WCS until at least 2024/25. Only OZEV approved installers and chargepoints are eligible for the EV chargepoint grants and the workplace charging scheme.[58]

Research and Development

6.1.13 Driving the Electric Revolution Challenge, delivered by UK Research & Innovation (UKRI), provides £80 million to scale-up and unite UK supply chains to deliver fundamental components of EVs and net zero – power electronics, electric motors, generators, and drives (PEMD). Funding is committed to support this initiative until at least 2025.

Taxi Charging

6.1.14 The **Ultra-Low Emission Taxi Infrastructure Scheme** competition enabled local authorities to bid for funds to install low emission taxis chargepoints. It was competed in two rounds: the first round was awarded in February 2017 and a second round was awarded in January 2019[59]. Three councils within the TfSE area were awarded funding:

- Slough Borough Council were awarded £157,500 to install 7 rapid chargepoints in the first round of funding.
- Kent County Council were awarded £180,000 to install 8 rapid chargepoints in the second round of funding.
- Brighton and Hove City Council were awarded £468,000 to install 12 rapid chargepoints in the second round of funding.

[58] Office for Zero Emission Vehicles, 'Grant schemes for electric vehicle charging infrastructure' (2022). https://www.gov.uk/government/collections/government-grants-for-low-emission-vehicles

[59] Office for Low Emission Vehicles, 'Ultra Low Emission Taxi Infrastructure Scheme: winners with funding amounts' (2020). https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/908606/ulev-taxi-infrastructure-scheme-winners-with-funding-amounts.csv/preview

7 Fleet Electrification Guidance

7.1.1 This section provides an overview of published fleet electrification guidance, produced for LTAs and also for fleet operators. This will be used to help guide the development of the strategy and in particular the forecasting infrastructure demand from fleet methodology. The main elements of each of the guidance documents are summarised below with further details provided in Appendix 3.

7.1.2 *The Energy Savings Trust Step-by-Step Guide to Electric Fleets*[60] provides a step-by-step guide to fleet electrification:

- Research the types of EVs and the models available.
- Identify which vehicles have suitable mileage profiles.
- Think about your charging requirements.
- Build the business case.
- Engage with your drivers.
- Monitor and share your success.

7.1.3 *Department of Transport's Zero Emission Fleets: Local Authority Toolkit*[61] provides an overview of the steps local authorities need to undertake for fleet electrification. This document covers the following steps:

- Identify which vehicles are suitable for replacement with EVs.
- Formulate a procurement strategy based on whole life costs.
- Review the options for charging and install chargepoints at council depots.
- Implement supporting measures, such as driver and mechanic training.

7.1.4 *Scottish and Southern Electricity Networks Connecting your EV Fleet Guide*[62] has been designed to help identify the most effective connection solution, and provides an overview of their engagement, design and connections processes. This includes key considerations for operators should to ensure they have enough power available at their premises to charge their EV fleet. The document contains the following steps:

- Understanding Your Demand Profile.
- Optimising your Network Connection.
- Calculating your Fleet Charging Requirements.
- Capacity Sufficiency.

7.1.5 This same guide also identifies support SSE can provide:

- Pre-application Meetings and Surgeries.
- Applying for a New or Upgraded Connection.
- Designing your Connection.
- Delivering your Connection.

7.1.6 *The British Vehicle Rental Licensing Agency Fleet Charging Guide*[63] provides a high-level overview of where and how fleets charge. This document also makes recommendations on focussed collaboration. The document also provides advice for LTAs on installing appropriate charging infrastructure. The document indicates that LTAs are well-positioned to play a supporting role in monitoring and addressing provision gaps (either through the distribution of funds or through collaboration with the private sector), ensuring that fleets are not left behind in the transition. The devolution of managing the roll-out of EV infrastructure to LTAs can allow for targeted and tailored approaches to local charging needs. However, this will increasingly need to balance risks of not accounting for cross-LTA needs, and the emergence of fragmented provision approaches. Therefore, it is recommended that:

- LTAs and DNOs work with the private sector to explore ways of pooling the cost of grid connections.
- LTAs should encourage the installation of more than one or two chargepoints in busy locations where reliability or redundancy is a key factor.
- LTAs and CPOs should agree enforceable service level agreements.

[60] Energy Saving Trust, 'Step-by-Step Guide to Electric Fleets' (2020). EST0018-001-EV-Guide-for-Fleet-Manager-WEB.pdf
[61] Department for Transport, 'Zero Emission Fleets: local authority toolkit' (2022). Zero emission fleets: local authority toolkit - GOV.UK (www.gov.uk)
[62] Scottish and Southern Electricity Networks, 'Connecting your EV Fleet Guide'. https://www.cpt-uk.org/media/eioej5of/ssen-ev-fleet-guide.pdf
[63] BVRLA, 'Fleet Charging Guide' (2022). https://www.bvrla.co.uk/static/06cc9a33-4064-4835-ae6a832b4abe32b0/BVRLAFleet-Charging-Guide-2022.pdf

- LTAs should require CPOs to provide dynamic data on chargepoint status and performance.
- LTAs should have an obligation to engage with fleet operators on future as well as present chargepoint provision.
- LTAs should work with DNOs, CPOs, fleet operators, regional transport boards and other stakeholders to promote regular engagement and sharing of data.
- LTAs should endeavour to establish a 'whole organisation' view of charging requirements across their region.

7.1.7 Further details on these documents are provided in Appendix 3, which also includes an overview of the importance of Fleet Guidance.

8 Conclusions

8.1.1 The TfSE area consists of 16 local transport authorities and 46 borough and district authorities. The majority of the study area is rural, with large counties such as East Sussex, West Sussex, Kent, Surrey and Hampshire. However, the study area also covers cities and heavily built-up areas surrounding London. There are unique challenges associated with implementing chargepoints within the TfSE area given the diverse nature. For example, West Berkshire is very rural with large amounts of terrace housing and a lack of off-street parking.

8.1.2 This working paper provides part of the evidence base to inform the development of TfSE's EVCI strategy, consistent with ambitions for net zero transport in the TfSE region by 2050.

8.1.3 A regional EVCI strategy provides direction, guidance and support for the LTAs, including forecasting demand for EVCPs, resulting in more effective EVCI implementation. The regional electric vehicle charging infrastructure strategy will also include an action plan. TfSE will have a critical role to play in executing the action plan, operating as a key facilitator for the region. TfSE will bring LTAs and other key stakeholders together to share EVCI related challenges, issues and seek solutions and opportunities to support their own strategies. In addition, TfSE can gather and disseminate the latest intelligence on funding and national policies.

8.1.4 In establishing the policy, operational trends and challenges impacting the future roll out of EVCI, policy analysis shows differences in the extent to which LTAs in the TfSE area have developed specific EV or ULEV strategies. As of summer 2022, only Surrey County Council, West Sussex County Council and West Berkshire Council had published EV or ULEV strategies. Eight other LTAs have an EV strategy in development. Slough Borough Council has a Low Emissions Strategy that incorporates consideration of EV infrastructure provision, as do Kent County Council and Medway Council. Within these dedicated policies, only two authorities have published forecasting or modelling predictions to determine anticipated infrastructure.

8.1.5 Analysis of other relevant LTA policy documents, including local transport plans and environmental strategies, confirms that the need for increased EVCI provision is widely recognised and referenced, although often without stated targets for EVCI provision.

8.1.6 DNO strategies include their commitments to support the development of local EVCI policies and roll-out plans by sharing data and models to inform decision making. Engagement with the DNOs is an essential element in the creation of the TfSE EVCI strategy, and subsequent successful implementation of the strategy.

8.1.7 In reviewing the market challenges for EV adoption and EVCI, it has been recognised that on-street charging provision could present a fundamental challenge for some LTAs in the TfSE region. For example, Kent County Council has already highlighted that they may be unable to consider lamppost charging solutions due to health and safety considerations with the placement of street furniture.

8.1.8 The growing trend of EV adoption is linked to a progressive increase in EV battery size and range and a reduction in EV purchase prices. As EVs approach price parity with Internal Combustion Engine (ICE) vehicles, the rate of EV adoption is expected to increase.

8.1.9 LTAs can access public sector funding to contribute to the costs of EVCP installation and operation. This working paper summarises the key government funds for EVCI. These include the ORCS and the LEVI funding. The scope of LEVI funding has just been extended to include resource funding (to develop and implement EVCI plans) as well as capital funding for EVCPs. Kent County Council and West Sussex Council both secured funding from the LEVI pilot fund.

8.1.10 A review of typical operating models includes options where private sector funding is used to install and maintain EVCPs at no cost to LTAs. Each operating model has advantages and disadvantages, which are summarised to help inform selection of the best-fit operating model given each LTA's circumstances. To add to this, LTAs in the TfSE region already have collective experience of operating under different models, so can share lessons learned with one another, facilitated by TfSE.

9 References

Automated and Electric Vehicles Act 2018 regulatory report, (2021). Automated and Electric Vehicles Act 2018 regulatory report - GOV.UK (www.gov.uk)

Borough of Windsor and Maidenhead Bus Service Improvement Strategy (2021). https://www.rbwm.gov.uk/sites/default/files/2021-11/rbwm_bus_service_improvement_strategy_november_2021.pdf

Borough of Windsor and Maidenhead Environment and Climate Strategy (2020). https://www.rbwm.gov.uk/home/environment-and-waste/energy-and-sustainability/environment-and-climate-strategy

Borough of Windsor and Maidenhead Local Plan (2013). https://www.rbwm.gov.uk/home/planning-and-building-control/planning-policy/development-plan/adopted-local-plan

Bracknell Forest Climate Change Strategy (2020). https://www.bracknell-forest.gov.uk/sites/default/files/2021-11/bracknell-forest-climate-change-strategy.pdf

Bracknell Forest Local Transport Plan – Core Strategy and Implementation Plan (2011).

Bracknell Forest Sustainable Modes Strategy (2018). https://www.bracknell-forest.gov.uk/sites/default/files/2021-11/sustainable-modes-strategy.pdf

Brighton and Hove 2030 Carbon Neutral Programme (2021). https://www.brighton-hove.gov.uk/sites/default/files/2021-06/Carbon%20Neutral%202030%20programme.pdf

Brighton and Hove Annual Committee Update (2021). https://www.brighton-hove.gov.uk/council-and-democracy/councillors-and-committees/committees-council-meetings-and-decision#

Brighton and Hove City Council, 'New charge point to support disabled electric vehicle owners' (2022). https://www.brighton-hove.gov.uk/news/2022/new-charge-point-support-disabled-electric-vehicle-owners

Brighton and Hove City Council, 'Over 200 electric vehicle charging points for Brighton and Hove' (2020). https://www.brighton-hove.gov.uk/news/2020/over-200-electric-vehicle-charging-points-brighton-hove#:~:text=Electric%20vehicle%20owners%20looking%20to,in%20the%20next%20few%20weeks.

Brighton and Hove Draft Bus Service Improvement Plan (2021). https://www.brighton-hove.gov.uk/sites/default/files/2021-10/7255%20Brighton%20%20Hove%20BSIP_FINAL.pdf

Brighton and Hove Local Transport Plan (2015). https://www.brighton-hove.gov.uk/sites/default/files/migrated/article/inline/BHCC%20Local%20Transport%20Plan%204%20Document%20v260515.pdf

BSI Group, 'Electric vehicles – Accessible charging – Specification' (2022). https://www.bsigroup.com/en-GB/standards/pas-1899/

BVRLA, 'Fleet Charging Guide' (2022). https://www.bvrla.co.uk/static/06cc9a33-4064-4835-ae6a832b4abe32b0/BVRLAFleet-Charging-Guide-2022.pdf

Connected Southampton Implementation Plan (2022). https://transport.southampton.gov.uk/media/2185/scc-ltp-implementation-plan-2022-mar-10_final-v2.pdf

Connected Southampton Transport Strategy (2019). https://transport.southampton.gov.uk/media/1073/mrd-1-connected-southampton-transport-strategy-2040.pdf

Department for Transport, 'Officer for Zero Emission Vehicles and Trudy Harrison MP' (2022). Drivers to benefit from £20 million EV chargepoint boost - GOV.UK (www.gov.uk)

Department for Transport, 'On Street Residential Chargepoint Scheme guidance for local authorities' (2022). https://www.gov.uk/government/publications/grants-for-local-authorities-to-provide-residential-on-street-chargepoints/grants-to-provide-residential-on-street-chargepoints-for-plug-in-electric-vehicles-guidance-for-local-authorities

Department for Transport, 'Zero Emission Fleets: local authority toolkit' (2022). Zero emission fleets: local authority toolkit - GOV.UK (www.gov.uk)

Developing a new Transport Plan for Brighton and Hove (2021) https://www.brighton-hove.gov.uk/sites/default/files/2021-09/7156%20Local%20Transport%20Plan%20consultation%20WEB.pdf

DfT, 'Transport and environment statistics: Autumn 2021' (2021).

Draft Reading Strategy (2020). https://wokingham.moderngov.co.uk/documents/s43093/App%201%20-%20ReadingTransportStrategyConsultation-WBC-summary%20002.pdf

East Sussex Bus Service Improvement Plan (2021) https://www.eastsussex.gov.uk/roads-transport/public/buses/bus-service-funding-and-schemes/bus-service-improvement-plan-for-east-sussex-county-council#:~:text=Our%20mission%20as%20a%20local,reduce%20congestion

East Sussex County Council's Climate Emergency Plan (2020). https://www.eastsussex.gov.uk/environment/priorities/what-we-are-doing/climate-emergency-plan

East Sussex Environment Strategy (2020). file:///C:/Users/bermingo4772/Downloads/environment-strategy-2020-final-document-accessible%20(1).pdf

East Sussex Local Transport Plan (2011). https://www.eastsussex.gov.uk/roads-transport/transport-planning/local-transport-plan/plan-3-2011-2026

East Sussex Local Transport Plan Implementation Plan (2016). https://democracy.eastsussex.gov.uk/documents/s7413/LMTE%20March%202016%20-%20Local%20Transport%20Plan%20Implementation%20Plan%202%20-%20App%20Plan.pdf

Electric Vehicle Database, 'Recently added electric vehicles'. https://ev-database.uk/compare/newest-upcoming-electric-vehicle#sort:path~type~order=.id~number~desc|range-slider-range:prev~next=0~600|range-slider-towweight:prev~next=0~2500|range-slider-acceleration:prev~next=2~23|range-slider-fastcharge:prev~next=0~1100|range-slider-eff:prev~next=150~500|range-slider-topspeed:prev~next=60~260|paging:currentPage=0|paging:number=9

Electrifying.com, 'Why wait? How to beat the queue for a new electric car' (2022). https://www.electrifying.com/blog/article/waiting-times-for-electric-cars

Element Energy, 'EV Charging Behaviour Study' (2019). http://www.element-energy.co.uk/wordpress/wpcontent/

Energy Saving Trust, 'On Street Residential Chargepoint Scheme' (2020-2021) https://energysavingtrust.org.uk/sites/default/files/ORCS%20Info%20Pack%2020-21%20V7.pdf

Energy Saving Trust, 'Step-by-Step Guide to Electric Fleets' (2020). EST0018-001-EV-Guide-for-Fleet-Manager-WEB.pdf

EV Volumes, 'Global EV Sale for 2022'. https://www.ev-volumes.com/

EV Volumes, 'Global EV Sales for 2022' (2022) https://www.ev-volumes.com/

FleetNews, 'Energy cost rise increases rapid charging rate by 50%' (2022). https://www.fleetnews.co.uk/news/latest-fleet-news/electric-fleet-news/2022/09/15/energy-cost-rise-increases-rapid-charging-to-1-per-kwh

Gov.uk, 'Automated and Electric Vehicles Act 2018 regulatory report' (2021). Automated and Electric Vehicles Act 2018 regulatory report - GOV.UK (www.gov.uk)

Gov.uk, 'Government Vision for the Rapid Chargepoint Network in England' (2020). https://www.gov.uk/government/publications/government-vision-for-the-rapid-chargepoint-network-in-england/government-vision-for-the-rapid-chargepoint-network-in-england

Gov.uk, 'Net Zero Strategy: Build Back Greener' (2021). https://www.gov.uk/government/publications/net-zero-strategy

Gov.uk, 'Transitioning to zero emission cars and vans: 2035 delivery plan' (2021). https://www.gov.uk/government/publications/transitioning-to-zero-emission-cars-and-vans-2035-delivery-plan

Gov.uk, 'Transport decarbonisation plan' (2021). https://www.gov.uk/government/publications/transport-decarbonisation-plan

Hampshire Carbon Mitigation Action Plan (2020)
https://democracy.hants.gov.uk/documents/s85117/Climate%20Change%20Annual%20Report%202020-21%20-%20Appendix%204-2021-10-12-Cabinet.pdf

Hampshire Climate Change Strategy (2020). https://documents.hants.gov.uk/environment/Hampshire-Climate-Change-strategy-2020-2025.pdf

Hampshire County Council, 'Southern Regional Framework for Electric Vehicle Charging Infrastructure – Framework Customer Access Agreement', (2022).
https://documents.hants.gov.uk/ccbs/EVFrameworkCustomerAccessAgreement.pdf

Hampshire Local Transport Plan (2022) https://documents.hants.gov.uk/transport/Hampshire-LTP-Final.pdf

HM Government, 'Electric vehicle charging infrastructure: help for local authorities' (2022). Electric vehicle charging infrastructure: help for local authorities - GOV.UK (www.gov.uk)

HM Government, 'Electric vehicle charging device grant scheme statistics: October 2022' (2022)
https://www.gov.uk/government/statistics/electric-vehicle-charging-device-grant-scheme-statistics-october-2022

HM Government, 'Taking Charge: The Electric Vehicle Infrastructure Strategy' (2022)
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065576/taking-charge-the-electric-vehicle-infrastructure-strategy.pdf

HM Government, 'UK becomes first major economy to pass net zero emissions law' (2019)
https://www.gov.uk/government/news/uk-becomes-first-major-economy-to-pass-net-zero-emissions-law

Horsham District Council Electric Vehicle Chargepoint Strategy (2020). Electric Vehicle Charge Point Strategy (horsham.gov.uk)

IEA, 'Global EV Outlook' (2021). https://www.iea.org/reports/global-ev-outlook-2021

Isle of Wight Draft Planning Strategy (2021). https://www.iow.gov.uk/azservices/documents/2981-Draft-Island-Planning-Strategy-July-2021.pdf

Isle of Wight Mission Zero Climate and Environment Strategy (2021).

Isle of Wight Transport Plan (2011). https://www.iow.gov.uk/azservices/documents/2782-FG1-Island-Transport-Plan.pdf

Kent and Medway Energy and Low Emissions Strategy (2020).
https://www.kent.gov.uk/__data/assets/pdf_file/0009/112401/Kent-and-Medway-Energy-and-Low-Emissions-Strategy.pdf

Kent Environment and Transport Cabinet Committee (2021).
https://democracy.kent.gov.uk/mgCommitteeDetails.aspx?ID=831

Kent Local Transport Plan 4: Delivering Growth without Gridlock (2016).
https://www.kent.gov.uk/__data/assets/pdf_file/0011/72668/Local-transport-plan-4.pdf

Medway Air Quality Action Plan (2015). https://democracy.medway.gov.uk/mgconvert2pdf.aspx?id=29144

Medway Climate Change Action Plan (2022). https://www.medway.gov.uk/climatechangeplan

Office for Low Emission Vehicles, 'Ultra Low Emission Taxi Infrastructure Scheme: winners with funding amounts' (2020).
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/908606/ulev-taxi-infrastructure-scheme-winners-with-funding-amounts.csv/preview
Office for National Statistics, 'Over half of younger drivers likely to switch to electric in next decade' (2021) https://www.ons.gov.uk/economy/environmentalaccounts/articles/overhalfofyoungerdriverslikelytoswitchtoelectricinnextdecade/2021-10-25

Office for Zero Emission Vehicles, 'Grant schemes for electric vehicle charging infrastructure' (2022).
https://www.gov.uk/government/collections/government-grants-for-low-emission-vehicles

Oxford City Council, 'Oxford trails world's first residential 'pop-up' on-street electric charging points' (2019). https://www.oxford.gov.uk/news/article/1246/oxford_trials_world_s_first_residential_pop-up_on-street_electric_vehicle_charging_points

PodPoint, 'Cost of Charging an EV' (2022). https://pod-point.com/guides/driver/cost-of-charging-electric-car

Portsmouth Bus Service Improvement Plan (2021). https://travel.portsmouth.gov.uk/wp-content/uploads/2021/11/Portsmouth-Bus-Service-Improvement-Plan-Oct-2021-1.pdf

Portsmouth Climate Emergency Strategy (2020). https://democracy.portsmouth.gov.uk/documents/s25687/Response%20to%20Climate%20Emergency%20Strategy%20appendix%20A.pdf

Portsmouth Local Transport Plan (2021). https://travel.portsmouth.gov.uk/wp-content/uploads/2021/10/Local-Transport-Plan-2021.pdf

Reading Bus Service Improvement Plan (2021). https://images.reading.gov.uk/2021/10/Reading-Bus-Service-Improvement-Plan-2021-26-accessible.pdf

Scottish and Southern Electricity Networks, 'Connecting your EV Fleet Guide'. https://www.cpt-uk.org/media/eioej5of/ssen-ev-fleet-guide.pdf

Scottish and Southern Electricity Networks, 'Electric Vehicle Strategy' (2020). https://www.ssen.co.uk/globalassets/electric-vehicle/ev-media/ssen-ev-strategy-september-2020.pdf

Sevenoaks District Council Low Emission and Electric Vehicle Strategy. Low emission and electric vehicle strategy | Sevenoaks District Council

Slough Low Emission Strategy (2018). https://democracy.slough.gov.uk/documents/s52745/Appendix%202%20-%20LES%20Technical%20Report%20Final%20Draft.pdf

Surrey County Council, 'Electric Vehicle On-Street Charging Policy' (2021). https://www.surreycc.gov.uk/roads-and-transport/policies-plans-consultations/policies-and-plans/electric-vehicle-on-street-charging-policy

Surrey County Council, Electric Vehicle On-Street Charging Policy, (2021). https://www.surreycc.gov.uk/roads-and-transport/policies-plans-consultations/policies-and-plans/electric-vehicle-on-street-charging-policy

Surrey Electric Vehicle Strategy (2018) https://www.surrey.ca/sites/default/files/media/documents/SurreyElectricVehicleStrategy.pdf

Swale Borough Council Draft Electric Vehicle Strategy (2022 – 2030). Draft Electric Vehicle Strategy 2022-2030 (swale.gov.uk)

TfSE, 'Becoming a statutory body' (2020). https://transportforthesoutheast.org.uk/about-us/becoming-a-statutory-body/

TfSE, 'Transport Strategy' (2020). https://transportforthesoutheast.org.uk/useful-documents/transport-strategy/

The Energy Saving Trust, 'Charging Electric Vehicles' (2019). https://energysavingtrust.org.uk/sites/default/files/23465-EST%2BDFT-Charging%20Electric%20Vehicles%20-%20Best%20Practice%20Guide-WEB.pdf

The Guardian, 'Electric car owners to pay road tax from 2025, Jeremy Hunt announces' (2022). https://www.theguardian.com/uk-news/2022/nov/17/electric-car-owners-to-pay-road-tax-from-2025-jeremy-hunt-autumn-statement

ThisisMoney.co.uk, 'Is this the answer to having more electric car chargepoints and clutter-free streets? Oxford installs UK's first pop-up devices that rise out of the pavement', (2019). https://www.thisismoney.co.uk/money/cars/article-7732287/Oxford-installs-UKs-pop-chargers-rise-pavement.html

Transport Nottingham, 'Wireless Charging of Electric Taxis (Wicet) (2022). https://www.transportnottingham.com/projects/wicet/

UK Power Networks, 'Electric Vehicle Scenario Guide' (2020) https://media.umbraco.io/uk-power-networks/xqbp5u1p/ev-scenarios-may-2020.pdf

UK Power Networks, 'Electric Vehicle Strategy' (2019). https://innovation.ukpowernetworks.co.uk/wp-content/uploads/2019/11/UK-Power-Networks-Electric-Vehicle-Strategy-November-19.pdf uploads/2019/04/20190329-NG-EV-CHARGING-BEHAVIOUR-STUDY-FINAL-REPORT-V1-EXTERNAL.pdf

Urban Foresight, 'Guidance On Improving Electric Vehicle Charging Infrastructure' (2021). Plymouth-Accessibility_v3.pdf (urbanforesight.org)

Waverley Borough Council Draft Electric Vehicle Strategy (2021-2026). 210330 EV Strategy 2021-26 draft (waverley.gov.uk)

West Sussex Electric Vehicle Strategy (2019). https://www.westsussex.gov.uk/media/13766/electric_vehicle_strategy.pdf

WhichEV, 'Public EV charging prices increase 14% since June according to Zap-Map' (2022). https://www.whichev.net/2022/11/14/public-ev-charging-prices-increase-14-since-june-according-to-zap-map/#:~:text=The%20price%20EV%20drivers%20are,charge%20points%20in%20the%20UK.

Wokingham Climate Emergency Action Plan Second Progress Report (2021). file:///C:/Users/bermingo4772/Downloads/WBC%20CEAP%20Report%20July%202021_Issued%20(1).pdf

Wokingham Climate Emergency Strategy (2020). file:///C:/Users/bermingo4772/Downloads/Climate%20Emergency%20Action%20Plan%20Council%2023012020%20(1).pdf

Wokingham Local Transport Plan (2011). https://www.wokingham.gov.uk/council-and-meetings/open-data/plans-policies-and-strategies/?assetdet91f252ff-550d-4cfa-a838-92ef2cb5f83c=210332&categoryesctl91f252ff-550d-4cfa-a838-92ef2cb5f83c=7749

ZapMap, 'Charging on the public network' (2022). https://www.zap-map.com/charging-price-index/

ZapMap, 'Zap-Map Price Index – Charging on the public network' (2022). https://www.zap-map.com/charging-price-index/

Appendix 1: National Policy Review

National Policy

HM Government 'Taking charge: the electric vehicle infrastructure strategy' (2022)

Informing EV uptake and charging infrastructure provision, the Government's recent electric vehicle infrastructure strategy outlines a vision for 2030 to remove charging infrastructure as both a perceived, and a real, barrier to the adoption of electric vehicles (EVs).

Highlighting the importance of world-class charging infrastructure to enabling net zero road transport, a strategic approach is given to delivering this charging infrastructure out to 2030. In doing so, a mixture of commercial considerations, commitments and behaviour patterns are outlined that this regional strategy shall cohere with.

Whilst acknowledging that 'specific predictions of the future mix and number of chargepoints are inherently uncertain in 2022 due to rapid developments in battery and charging technology, and because consumer preferences about where and when they would like to charge are still being revealed', the strategy attempts to quantify expectation on the extent of the charging network by 2030. The strategy states that it is expected there will be around 300,000 public chargepoints as a minimum in the UK, but there could potentially be more than double that number.

The strategy seeks to ensure the UK EV charging network is a place where:

- Effortless on and off-street charging for private and commercial drivers is the norm and must extend beyond privately owned cars (e.g., those who drive vans or commercial vehicles) – easy overnight charging is, and will remain, the default for those with driveways.
- Inclusively designed and fairly priced public charging is open to all.
- Market-led rollout for the majority of chargepoints delivers a thriving charging sector.
- A smart energy system seamlessly integrates infrastructure.
- Innovation to meet drivers' needs lowers costs and increases convenience.

Table 10 summarises the strategic framework outlined in the policy:

Table 10 HM Government taking charge: The electric vehicle charging infrastructure strategy – strategic framework areas

Strategic Area	Detail
Focus intervention on two crucial sectors where accelerated rollout is needed and where business cases can be challenging: (1) high powered chargers on the strategic road network. (2) and local on-street charging.	- Accelerate the rollout of high-powered chargers on the strategic road network through the £950m Rapid Charging Fund (England only). - Ensure that every motorway service area has at least six rapid chargers by the end of 2023, with some having more than 12. There will be over 6,000 high powered chargers along our strategic roads by 2035. Electricity network capacity at motorway service areas will be ready to meet demand to 2035 and beyond. - Transform local on-street charging by putting an obligation on local authorities (subject to consultation) to develop and implement local charging strategies to plan for the transition to a zero-emission vehicle fleet. Needs to consider charging opportunities for other vehicles, including e-bikes and motorbikes.
Allow thriving sectors to thrive and address barriers to private sector rollout.	- Look to end direct subsidy support for home charging and workplace charging at the earliest appropriate time. - Help to reduce the costs to businesses by tackling barriers to investment and delivery of public chargepoints. Where barriers are slowing down private sector deployment, we will address them: for example, we will consult on measures to make Traffic

	Regulation Orders (part of the process to install on-street chargepoints) more straightforward.
Give people confidence in the public network. We will regulate to ensure chargepoints are reliable and easy to use.	- Requirements on open data, price transparency, payment methods and reliability. - Develop chargepoint design standards to improve accessibility and signage.
Work with Ofgem to ensure chargepoints can seamlessly integrate with the energy system.	- Making sure that the bulk of charging is 'smart' and ideally off-peak, that connection costs do not avoidably deter chargepoint deployment, and that EV charging infrastructure makes the most efficient use of the electricity system.
Support innovation in business models and technology	- Previously unimagined rates of charging are now possible and wireless charging is nearing commercial deployment. - Huge scope for chargepoint operators to gain by selling services to the grid, for the grid to gain by increasing flexibility, and for consumers to ultimately benefit through cheaper, and potentially even negative, tariffs - Continue to facilitate this innovation and encourage new business models to deliver the charging we need. This could be through local community charging companies, longer-term on-street concessions, remote charging, cable guttering, lamppost chargers or peer-to-peer charging services.

Error! Reference source not found. Table 11 summarises the subsequent commitments involved in this strategy.

Table 11 Commitments from HM Government taking charge: The electric vehicle infrastructure strategy 2022

Area	Commitment	Timescales
Support the accelerated rollout of a comprehensive and competitive rapid charging network on major roads	Work with the private sector to ensure there are at least six high powered chargepoints at each motorway service area by the end of 2023.	**End 2023**
	Consult on the design of the £950m Rapid Charging Fund. This fund will support the rollout of at least 6,000 high powered chargepoints across England's motorways and major A-roads by 2035, by enabling electricity network infrastructure to be installed ahead of chargepoint demand.	**Winter 2022 / Spring 2023**
	Launch pathfinder projects for the Rapid Charging Fund, ahead of the fund opening in 2023.	**Winter 2022**
Support local government to develop chargepoint strategies and scale up the rollout of public chargepoints on local streets	Provide local authorities with grant funding through the On-Street Residential Chargepoint Scheme. The scheme has supported 2,038 chargepoints to date, with a further 4,539 planned for 2021-22.	**Ongoing**

	Provide expert support, through the Local Government Support Programme, to local authorities seeking to develop chargepoint strategies, procure chargepoints and apply for funding.	**Ongoing**
	Launch the £10m Local EV Infrastructure (LEVI) pilot project.	**Spring 2022**
	Invest at least a further £500m to support local authorities to plan and deliver local public charging infrastructure. This will include the £450m Local EV Infrastructure (LEVI) Fund, and the On-street Residential Chargepoint Scheme. The LEVI Fund includes up to £50m to fund the staff needed to do this work, and the supporting knowledge and tools to help them to work out their specific local challenges and plan accordingly.	**2022-2025**
Allow thriving sectors to thrive and address barriers to private sector rollout	Building regulations requiring new homes and non-residential buildings to include chargepoints come into force.	**Summer 2022**
	Refocus the Electric Vehicle Home Charging Scheme (EVHS) and the Workplace Charging Scheme (WCS) to ensure they are targeted at those areas still needing support, such as flats and rented accommodation, or small accommodation businesses and charities.	**Ongoing**
	Consider amendments to the Transport Planning Practice Guidance (PPG) relating to chargepoints, to make local approaches to chargepoint planning and delivery more consistent and streamlined.	**Summer 2022**
	Consult on measures to make Traffic Regulation Orders (part of the process to install on-street chargepoints) more straightforward.	**Spring 2022**
Regulate to make sure public chargepoints are reliable and easy to use	Introduce new legislation to improve people's experience when using public chargepoints. Legislation will be introduced in spring 2022 and come into effect in summer 2022. We will work with industry to open up data so that drivers can access real time information about chargepoints across the public network, rely on the public chargepoint network with improved reliability, compare prices, and pay for their charging easily, whoever	**Summer 2022**

	the chargepoint provider. We will also be supporting fleet electrification by introducing payment roaming across the public chargepoint network.	
	Improve accessibility at public chargepoints for disabled users. We will work in partnership with Motability and have commissioned the British Standards Institute (BSI) to develop accessible charging standards. These standards will provide guidance to industry and allow drivers to easily identify which chargepoints are suitable for their needs.	**Summer 2022**
	Publish the Government response to the Future of Transport Regulatory Review proposals that were consulted on in 2021.	**Summer 2022**
Work with Ofgem to make sure that chargepoints are easy to connect and integrate with the electricity system	Accelerate the widespread deployment of vehicle-to-everything (V2X) technologies, working in close collaboration with Ofgem and industry. We will publish a summary of our recent Call for Evidence and outline next steps.	**Summer 2022**
	Mandate that, from June 2022, private chargepoints sold in GB must be smart and meet minimum device-level requirements.	**Summer 2022**
	Maximise the opportunities for flexibility from EVs while protecting the electricity grid and consumers, publishing a joint Government-Ofgem Electric Vehicle Smart Charging Action Plan.	**Summer 2022**
	Identify the role of smart charging in the public infrastructure network and consider mechanisms to deliver this.	**Summer 2022**

Decarbonising Transport – A Better, Greener Britain (2021)

For this working paper, it is useful to understand the direction UK Government is moving towards in terms of ULEV policy and strategy. By law, the UK's emissions must now be net zero by 2050. The Government has committed to remove all emissions from road transport:

2030 – End the sale of new petrol and diesel cars and vans.
2035 – All new cars and vans must be 100% zero emission at the tailpipe.
2035 – All new L-category vehicles to be fully zero emissions at the tailpipe.
2040 – End the sale of all non-zero emission HGVs.

Given the crucial role local authorities play in supporting the roll-out of charging, and to navigate the complexities involved, the Government published an EV infrastructure guide for local authorities in 2022[64]. For those households

64 HM Government, 'On-Street Residential Chargepoint Scheme guidance for local authorities (2022). https://www.gov.uk/government/publications/grants-for-local-authorities-to-provide-residential-on-street-chargepoints/grants-to-provide-residential-on-street-chargepoints-for-plug-in-electric-vehicles-guidance-for-local-authorities

unable to charge at their home, the On-Street Residential Scheme supports local authorities in installing EV infrastructure on-street and in public car parks, and the workplace charging scheme/EV homecharge scheme are committed to continue.

The Government will further regulate to ensure that all new home and workplace chargepoints have smart capability by the end of this year and through regulation by Ofgem, network operators must ensure that they provide connecting customers with the cheapest option that meets their requirements.

'Decarbonising Transport – A Better, Greener Britain' makes further commitments to demonstrate zero emission HGV technology on UK roads this year and decarbonise how we get our goods, including hydrogen. The document also states a commitment to stimulate demand for zero emission trucks through financial and non-financial incentives.

Transitioning to Zero Emission Cars and Vans: 2035 Delivery Plan

Whereas the 'Decarbonising Transport' (2021) strategy is holistic, encompassing multi-modal action points, the '2035 Delivery Plan' expands upon specific commitments made regarding zero emission cars/vans.

The 2035 delivery plan states: 'our commitment to transitioning to zero emission vehicles are for the whole of the UK. The grants for plug-in cars and vans, as well as the grants for home, workplace, and on-street chargepoints are all available UK-wide.

Error! Reference source not found.: is taken from the 2035 delivery plan and visualises the forthcoming government guidance as well as funding to realise ambitions around net zero cars and vans[65]

Error! Reference source not found.: *Timeline of key deliverables*

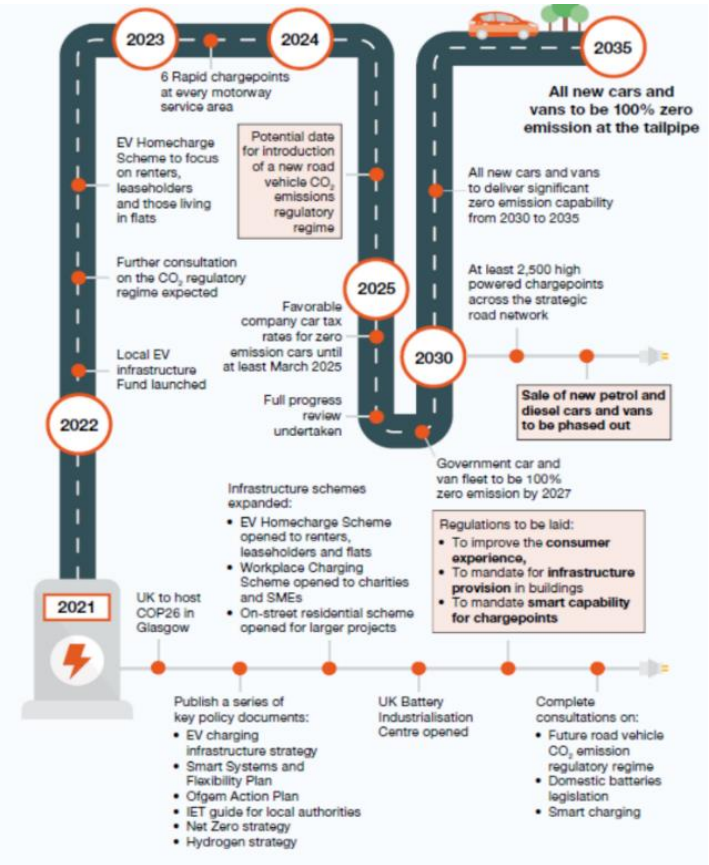


Table 12

Table 12 Commitments summary – Transitioning to zero emission cars and vans: 2035 below summarises the main commitments across three broad areas of the delivery plan.

[65] Note, not all initiatives on the roadmap apply to Wales/are available funding sources (e.g., Local EV Infrastructure fund).

Table 12 Commitments summary – Transitioning to zero emission cars and vans: 2035 delivery.

Increasing Uptake of Zero Emission Vehicles	Accelerating Infrastructure Roll-Out	A Sustainable Transition
Aim to introduce a new road vehicle CO_2 emissions regulatory regime in 2024.	Publish an EV Infrastructure Strategy in 2021.	Published our smart charging consultation response and later this year will legislate to mandate that all private chargepoints must be smart.
Continue to fund the plug-in van grant until at least 2022/23.	Support provision of on-street chargepoints until at least 2024/25.	Publish with Ofgem a second phase of the Smart Systems and Flexibility Plan (SSFP) in 2021 to set out reforms needed to secure flexibility across the energy system, including EVs.
Review the Category B derogation in 2021.	Ofgem is considering changing the way charges for connecting to the electricity network are allocated. It has recently published a consultation proposing that all network reinforcement costs should be socialised across energy bill payers in future. This should often reduce the costs of connecting EV chargepoints to the network. Any changes are expected to come into force in 2023.	In conjunction with Ofgem, publish a plan to maximise the contribution of EV flexibility in 2022.
Accelerate Government fleet commitment – 100% of our car and van fleet will be fully zero emission at the tailpipe by 2027.	Shift the support of the EV Home Charge Scheme (EVHS) to focus on leaseholders, renters and those living in flats from April 2022.	Publish a call for evidence for Vehicle-to-everything (V2X) technologies in a net zero energy system.
We will work closer than ever with local authorities, to encourage uptake of central government funding and ensure more widespread action in the transition to ZEVs.	Continue to fund EVHS until at least 2024/25.	Publish a consultation on domestic batteries legislation in 2021 to ensure we have an appropriate legal framework governing the increasing numbers of EV batteries.
	Continue to fund the Workplace Charge Scheme until at least 2024/25.	Publish a Net Zero Strategy including the recommended actions of the Green Jobs Taskforce in 2021.

In addition, the 2035 delivery plan states a commitment to publish a Hydrogen Strategy in 2021 to develop the UK's Hydrogen economy and to continue to fund the Hydrogen for Transport Programme until 2022.

The delivery plan also states there will be a £240 million Net Zero Hydrogen Fund (NZHF) to support measures detailed in the 2021 Hydrogen Strategy. Consultation states the preferred approach and scope of this funding source with respect to devolved administrations and its scope are as follows: 'our preferred approach is for the NZHF will be funded and delivered on a UK-wide basis to support decarbonisation across the UK'.

Net Zero Strategy: Build Back Greener (2021)

The UK Government's Net Zero Strategy (2021) provides an important policy context for this regional EV charging strategy. The strategy sets out clear policies and proposals for UK adherence to carbon budget commitments, setting out the vision for a decarbonised economy in 2050.

Domestic transport has the largest share of UK greenhouse gas emissions of any sector across the economy, equating to 23% in 2019. 55% of these emissions are from passenger cars, contributing 68 $MtCO_2e$. This is followed by heavy goods vehicles and light goods vehicles, both respectively contributing 19 $MtCO_2e$ (16%). The remaining emissions in domestic shipping, road transport, rail, and domestic aviation contribute a further 16 $MtCO_2e$ (13%) collectively.

The Net Zero Strategy lists key commitments regarding the implementation of EV infrastructure and encouraging a modal shift towards more sustainable forms of transport. For example, the UK Government have committed to introduce a zero-emission vehicle mandate setting targets for a percentage of manufacturers' new car and van sales to be zero emission each year from 2024. They also have committed to ending the sale of new petrol and diesel cars and vans from 2030, with all new cars and vans being zero tailpipe emission from 2035. Similarly, they pledge to end the sale of all new, non-zero emission road vehicles, from motorcycles to buses and HGVs, by 2040.

The UK Government have pledged to ensuring the UK's charging infrastructure network is reliable, accessible, and meets the demands of all motorists. On top of the £12 billion, the UK Government are investing into local transport systems to support decarbonisation, they have committed an additional £620 million to support the transition to electric vehicles, with a particular focus on local on-street residential charging and targeted plug-in vehicle grants.[66]

The UK Government have also committed to building a globally competitive zero emission vehicle supply chain, reducing the barriers to data sharing across the transport sector, and maximising carbon savings from the use of low carbon fuels (including by increasing the main Renewable Transport Fuel Obligation (RTFO) target), ensuring that the UK's automotive sector is at the forefront of the transition to net zero.

The UK Government plan to lead by example with 25% of the government car fleet ultra-low emission by December 2022 and all the government car and van fleet zero emission by 2027 and want to take action to increase the average road vehicles occupancy by 2030.

Government Vision for the Rapid Chargepoint Network in England (2020)

In May 2020, the Government set out the rapid chargepoint network The Government vision for the rapid chargepoint network in England is set amidst consultation to bring forward the end of new petrol and diesel vehicle sales to 2035.

The current situation regarding EVCP is outlined, stating that currently, a driver is never more than 25 miles away from a rapid (50 kilowatt) chargepoint anywhere along England's motorways and major A roads, with a total of 809 open-access rapid chargepoints, as of 1 Jan 2020 (including average of 2 rapid chargepoints at motorway service areas with more rolled out over the next year).

The Government's vision outlines the following ambitions [67]to be supported by the Rapid Charging Fund to assist where the electrical connection costs of upgrading sites to meet future charging demand is not commercially viable. The fund comprises a £500 million commitment for EV charging infrastructure to ensure long-term consumer demand for EV chargepoints is met and to fund a portion of sites on SRN where upgrading connections to high powered chargepoints is prohibitively expensive.

[66] HM Government, Net Zero Strategy: Build Back Greener (2021).
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1033990/net-zero-strategy-beis.pdf

[67] Vision expects new chargepoints will be easy to use and hassle-free, meaning:

- - Drivers can pay for the cost of charging their vehicle using debit or credit card payment
- - Openly available information about the chargepoints on motorways,
- - Chargepoints available 99% of the time,
- - 24/7 customer care to handle any technical issues,
- - Chargepoints support all types of electric vehicles,
- - Clear pricing information available in pence per kilowatt hour.

Table 13 Government vision for rapid chargepoint network in England ambitions

Target Date	Ambition
2023	To have at least high powered, open access chargepoints[68] (150 – 350 kilowatts capable) at motorway service areas in England, (some larger sites having as many as 10-12).
2030	Planning for there to be around 2,500 high powered chargepoints across England's motorways and major A roads.
2035	Expect 6,000 high powered chargepoints across England's motorways and major A roads.

Department for Transport (DfT) Road to Zero (2018)

The DfT Road to Zero strategy centres around an ambition 'to put the UK at the forefront of the design and manufacturing of zero emission vehicles and for all new cars and vans to be effectively zero emission by 2040'. By 2050, DfT Road to Zero wants almost every car and van to be zero emission.

The strategy sets out ambition for at least 50% — and as many as 70% — of new car sales to be ultra-low emission by 2030, alongside up to 40% of new vans.

Road to Zero states that currently, there are around 14,000 public chargepoints (including more than 1,300 rapid chargers) across the UK with numbers increasing. However, it is claimed more are needed[69]. Locations are not explicitly stated but the 2015 Roads Investment Strategy by DfT states 'Wherever possible, these will be rapid charging points that can charge a battery-powered electric vehicle in less than 30 minutes.

To that end, funding commitments are stated to support the development of the public chargepoint network working with local areas, including the eight Go Ultra Low Cities, and through the £400 million Charging Infrastructure Investment Fund.

Table 14 summaries future commitments to EV provision and associated infrastructure provision:

Table 14 DfT road to zero commitment

DfT Road to Zero Commitment
1 £246 million to research next generation battery technology through the Faraday Battery Challenge.
2 Support EVCP infrastructure network by: a. £400 million Charging Infrastructure Investment Fund to help accelerate charging infrastructure deployment. b. taking powers through the Automated and Electric Vehicles Bill to ensure chargepoints are available at motorway service areas and large fuel retailers, and chargepoints are easily accessed and used across the UK.
3 To consult on introducing a requirement for chargepoint infrastructure for new dwellings in England where appropriate.
4 DfT want all new street lighting columns to include charging points, where appropriately located, in areas with current on-street parking provision.[59]

[68] These high powered chargepoints are able to charge up to 3 times faster than most of the chargepoints currently in place and can deliver around 120-145 miles of range in just 15 minutes for a typical electric vehicle.
[69] Highways England are committed to ensuring there is a chargepoint every 20 miles along the strategic road network by 2020 (DfT, Road to Zero).

5	Increase grant level of the Workplace Charging Scheme from £300 per socket to 75% of the purchase and installation costs of a chargepoint (maximum cap of £500 per socket).
6	Review the provision of residential chargepoint infrastructure for those who have communal parking facilities, or do not own their own home.
7	Ensure local planning policies incorporate EV charging facilities via the National Planning Policy Framework.
8	Consult on amending building regulations to require charging provision in new non-residential buildings.
9	Develop and trial innovative, low-cost wireless charging and public on-street charging solutions deployable across entire residential streets.
10	Pilot to increase electrical capacity at a motorway service area working closely with Highways England.
11	Launching EV taskforce to bring together electric and automotive industries (plan for future uptake and energy demand)
12	Monitor market development and determine gaps in charging infrastructure. Consider central government support in areas of market failure (e.g., rural areas).
13	Already committed to 25% of central government's car fleets being ultra-low emission vehicles by 2022 and for all new central Government car fleet purchases to be ultra-low emission by default. 100% ultra-low fleet by 2030.
14	£400m infrastructure charging fund.

Clean Air Strategy (2019)

The Clean Air Strategy tackles all sources of air pollution, complementing three other UK Government strategies: Industrial Strategy, Clean Growth Strategy and the 25 Year Environment Plan. The strategy supports the Road to Zero measures, alongside existing action towards tackling air pollution. The strategy notes the various existing funding towards electric vehicles:

- Nearly £1.5 billion supporting the take-up of ultra-low emission vehicles
- £2 million to support the uptake of e-cargo bikes in order to make last mile delivery more sustainable and to reduce vehicle emissions
- up to £246 million in the design, development and manufacture of electric batteries through the Faraday Challenge
- Provided £119 million for the purchase of low emission vehicles and £27 million for retrofitting of existing bus fleets. In 2016, DfT announced a further £100 million, provided between 2017/18 and 2020/21. £11.1 million was awarded in August 2017 for new low emission buses via the Low Emission Bus Scheme. £40 million was awarded in February 2018 for retrofitting buses through the Clean Bus Technology Fund. The remaining funding, around £48 million, has formed the Ultra-Low Emission Bus Scheme, with winners due to be announced in January 2019.
- The strategy also notes the existing targets towards electric vehicles:
- 95% of the network will have a chargepoint for electric vehicles every 20 miles
- At least 90% of the NHS fleet will use low-emissions engines (including 25% ultra-low emissions) by 2028, and primary heating from coal and oil fuel at NHS sites will be fully phased out.

Through discussion with academics, industry and NGOs, the document identified a number of priority areas where innovation funding would support achieving the air quality goals; one of which was zero or ultra-low emission heavy goods vehicles.

Automated and Electric Vehicles Act (2018)

Pertinent to this TfSE EV strategy, the Automated and Electric Vehicles Act notably states the following regulations may be imposed:

- Regulations may require operators of public charging or refuelling points to make available prescribed information relating to such points (e.g. the location of the point and its operating hours, available charging or refuelling options, the cost of obtaining access to the use of the point, the method of payment or other way by which access to the use of the point may be obtained, means of connection to the point, whether the point is in working order, and whether the point is in use).
- Regulations may make provision for the purpose of ensuring the ongoing transmission of chargepoint data to a prescribed person or to persons of a prescribed description.
- Regulations may impose requirements on— large fuel retailers falling within a prescribed description, or service area operators falling within a prescribed description, in connection with the provision on their premises of public charging or refuelling points. Regulations may, for example—require large fuel retailers or service area operators to provide public charging or refuelling points, require public charging or refuelling points to be available for use at prescribed times, or require services or facilities prescribed by the regulations to be provided in connection with public charging or refuelling points.
- Duty to consider making regulations regarding large fuel retailers etc: provision of public charging or refuelling points falling within a prescribed description on request by an elected mayor.
- Prohibit the sale of chargepoints in the UK unless they meet certain requirements (e.g., Smart charging, technical specifications to receive and process information/react to information, transmit information, monitor and record energy consumption, comply with security regulations, achieve energy efficiency, be accessed remotely).

Appendix 2: Local Authority Commitments

This section provides a list of additional and wider commitments from a small number of councils where they have multiple documents with EV and EVCI related commitments. These relate to the broader electrification of vehicles.

Bracknell Forest Borough Council

Local Transport Plan – Core Strategy and Implementation Plan (2011-2026)
Key commitments, objectives and forecasts include:

- Providing infrastructure to support electric vehicle use will be actioned from 2014-2025
- The Council will continue to facilitate the provision of parking in the borough through promoting dedicated parking bays with recharging points for electric vehicles.
- The Council will continue to encourage the provision of high-quality taxi and private hire vehicle services within the borough through encouraging fleet operators, bus operators, taxi owners and other motorists to use alternative fuels / low emission vehicles.
- The Council will aid the effective movement of freight through encouraging more environmentally friendly freight, including the use of alternative fuels and low emission vehicles.

Medway Council

Medway Climate Change Action Plan (2022)
Key commitments, objectives and forecasts include:

- Ensure the future long-term sustainability of EV charging by integrating infrastructure into new development, as stipulated within Air Quality Planning Guidance and central government.
- Ensure Medway's residents and businesses understand the options for and benefits of EV ownership, are aware of grants they can apply for, and where they can find charging points to encourage usage.
- Explore opportunities for phased uptake of ULEV on supported bus routes.
- Replace Council fleet of small vehicles (owned and leased) with electric by end of first carbon budget (2027) or where possible at next point of exchange (latest 2025) and once EV chargepoints are in place.
- Explore opportunities for differential charging rates for CPZ permits and season tickets based on vehicle emissions.

Kent County Council and Medway Council's Energy and Low Emissions Strategy (2020)
Key commitments, objectives and forecasts include:

- The Council will reduce greenhouse gas emissions from their own estate and activities, as well as from the whole county, to net zero by 2030.

Isle of Wight Council

Isle of Wight Council Transport Plan (2011-2038)
Key commitments, objectives and forecasts include:

- The Council will encourage use of environmentally friendly vehicles (e.g., provision of electric car charging points, low emission buses) to protect and enhance the environment & quality of life and improve road safety and health.

Isle of Wight Council Draft Planning Strategy (2021)
Key commitments, objectives and forecasts include:

- To support the use of ultra-low emission vehicles the council will facilitate the introduction of charging points in appropriate public places, and proposals for the installation of charging points and associated infrastructure will be supported.
- Proposals for major development should ensure an adequate provision of charging infrastructure in active or passive parking spaces. Adequate provision is considered to be one electric vehicle charging point per dwelling with a garage or driveway and one charging point per 10 spaces of communal parking, although this should be seen as a minimum. Also, to help prepare for increasing future demand, appropriate wiring and cabling should be installed to future proof any parking provision without a dedicated charging point.
- Active spaces that are fully wired and connected, with ready to use points in parking spaces is the council's preferred approach. Passive provision requires the necessary underlying infrastructure (e.g., capacity in the connection to the local electricity distribution network and electricity distribution board, as well as cabling to parking spaces) to enable simple installation and activation of a chargepoint at a future date.

Kent County Council

Environment and Transport Cabinet Committee (2021)
Key commitments, objectives and forecasts include:

- A new set of Planning Parking Guidance is due to be published in the Kent Design Guide, supporting national Building Regulations changes to require EV charger installations and passive installations (ducting and cabling) to be installed in new developments.
- Kent County Council together with all other Local authorities in Kent have set ambitious net-zero targets, in almost all cases to be achieved for their own organisation by 2030. This will require most public sector fleet vehicles to be switched to electric or other low emission fuel by this date.

Kent County Council and Medway Council's Energy and Low Emissions Strategy (2020)
Key commitments, objectives and forecasts include:

- The Council will reduce greenhouse gas emissions from their own estate and activities, as well as from the whole county, to net zero by 2030.

Portsmouth City Council

Portsmouth Climate Emergency Strategy (2020)
Key commitments, objectives and forecasts include:

- The Council is working on transitioning its own fleet to electric vehicles
- The city-wide EV infrastructure is being developed; however more charging points will need to be installed on council owned properties.
- Across the breadth of the council's activities, opportunities that will be considered in the coming months, and reflected in the next strategy refresh are the transition of own fleet to electric vehicles and requiring deliveries to made by electric vehicles.

Portsmouth Local Transport Plan (2021-2038)
Key commitments include:

- As well as support for charging infrastructure the Council will provide advice to those wanting to upgrade their commercial fleets to cleaner vehicles.
- The Council will also seek to support taxis and private hire vehicles by providing a network of rapid charging points/hubs at key locations across the city such as on strategic corridors and at ferry ports. Changes to licensing requirements for taxis and private hire vehicles to incentivise the uptake of low and zero-emission vehicles have now been made. From 2025 newly licensed taxis and private hire vehicles must be electric or hybrid and with effect from 2022 re-licensed vehicles must be no more than eight years old and newly licensed no more than four. To aid with the transition of the taxi fleet towards compliant vehicle types, the council will seek to provide financial support through grant funding
- The Council will also seek to work with large fleet operators to support a move to EV use as appropriate and as technology progresses.

Reading Borough Council

Draft Reading Strategy (2020-2036)
Key commitments, objectives and forecasts include:

- The Council will continue to support a shift towards electric taxis and will work with taxi and private hire service operators to identify ways in which we can support fleet changes. A planned incentive involves a 50% reduction in vehicle fee for electric vehicles, and a free vehicle licence fee for October 2021 to October 2022 for electric vehicles which have never been part of Reading's taxi fleet before. Additionally, by 2028, all hackney carriages in Reading will be required to be either electric or ULEVs.
- The Council will also work with operators to explore and support more sustainable delivery methods, such as electric micro-vehicles for the last mile delivery.
- Fast Track Public Transport Corridors development will promote the use of electric vehicles.
- Given the strategic location of the Council's Park and Ride sites, there is opportunity for these to become electric charging stations.
- Emissions-based charging charges drivers for various actions at a rate that is dependent on their vehicle's emissions is being considered.
- The Council will support installation of electric vehicle charging points on-street within the borough and will also support the introduction of electric car club vehicles and associated charging bays.
- The Council will also monitor EV demand and review land use policies for the installation of EV garages as battery technology improves across the growing EV fleet.

Royal Borough of Windsor and Maidenhead

Local Plan (2013-2033)

Key commitments, objectives and forecasts include:

- Development proposals which may result in significant increases in air pollution must contain appropriate mitigation measures, such as electric vehicle charging parking points.
- Parking provision must include electric vehicle charging points where appropriate.

Environmental and Climate Strategy (2020-2025)
Key commitments, objectives and forecasts include:

- The Council will create conditions for sustainable travel through the provision of infrastructure such as electric vehicle charging points to minimise air pollution impacts.

Slough Borough Council

Slough Low Emission Strategy (2018-2025)
Key commitments, objectives and forecasts include:

- Develop an Electric Car Club across the borough; Link and compliment with a potential Ultra-Low Emission Zone at Heathrow; Tackle the perceived and actual barriers to EV ownership through targeted marketing, promotion and information; Work with the Thames Valley Berkshire Local Enterprise Partnership to help businesses achieve resource efficiency savings and to attract investment in ULEV technology and infrastructure.

Southampton City Council

Connected Southampton Implementation Plan (2022-2025)
Key commitments, objectives and forecasts include:

- Committed and fully funded to increase the number of public EV chargepoints available in the city. Set to be delivered 2022-2025 with a £1-5 million budget range.
- Aspirations to upgrade bus feet to electric vehicles as funding to be identified. Set to be delivered 2022-2025 with a £5-20 million budget range.
- Aspirations to deliver Residential Mobility Hubs consisting of electric vehicle charging points, cycle stands, and other features, as funding to be identified. Set to be delivered 2022-2023 with a budget of less than £1 million.

Wokingham Borough Council

Climate Emergency Strategy (2020)
Key commitments, objectives and forecasts include:

- Policies aim to increase the number of electric cars in the borough to reduce and improve air quality.

Climate Emergency Action Plan Second Progress Report (2021)
Key commitments include:

- The Council have set a target of 50% EVs registered in the borough by 2030, to be achieved through developing an EV strategy, providing a uniform method of accessing public and private chargepoints, reviewing the residential chargepoint infrastructure for those who have communal parking facilities, ensuring that all EV charging points installed in the borough are ‘smart ready’ to balance the electricity load demand, supporting local businesses, including commercial property owners, to transition their commercial fleets to EV, delivering a sustained campaign to inspire residents and local businesses to ‘Go Ultra Low’ and transition to EVs and coordinating the installation of EV charging points into private and commercial owned land in line with the EV network plan approved in the strategy.
- The Council have set a target of all Council’s car fleet becoming entirely ultra-low emission by 2028. This is to be achieved by installing EV charging points into council owned buildings in line with the EV network plan approved in the strategy and establishing contractual policies that promote the use of EV or ultra-low emissions vehicles as the council’s preferable vehicles, including on education and social care services.
- The Council have set a target of 100% new buildings are EV ready from 2022, achieved by making all new houses electric vehicle ready by establishing requirements for EV charging points in new dwellings as described in the EV strategy.

District and Borough EV Strategies

The below provides further information not detailed within the main body of the report on the EV strategies within the TfSE area district and borough authorities to highlight their commitments and objectives with regards to EVCI and EVs.

Swale Borough Council Draft Electric Vehicle Strategy (2022 – 2030)

Objective 1: Creating and facilitating a network of EVCPs that meets the needs of residents, businesses, and visitors, with sufficient coverage by 2030 (Short – medium term timeframe)
To promote residential charging, the Council will:

- Encourage the installation of chargepoints through charging hubs across the borough, working with KCC where on-street is suitable, and encouraging installation in developments, reviewing on- and off-street charging provision regularly
- Continue to consult with residents and respond to local demand by considering these locations for charging points if suitable, especially if residents do not have access to off-street parking
- Continue to encourage use of slow chargepoints overnight in car parks in close proximity to residential areas via charging hubs based on local data
- Promote the Home Chargepoint Scheme to residents to encourage private chargepoint installation
- Support and publicise KCC guidance ('Electric Vehicle Charging on the Highway') prohibiting cables trailing across pathways
- Explore potential for local amenities such as village halls, parks and business parks within proximity to residential areas in which chargepoints could be installed to enable overnight charging where on- street chargepoints are not suitable (for example, engage with the KCC parish chargepoint scheme)
- Work to keep the cost of charging at council owned chargepoints below the market value to avoid disadvantaging residents without access to off-street parking
- Support the Parking SPD requirements for 1 active charging point per dwelling; 10% active charging spaces for dwellings with unallocated communal parking; minimum of two visitor spaces should be provided with passive charging provisions suitable for future conversion; and ensure this document is reviewed periodically and remains up to date
- Use the Local Plan Review to require that where a development is for more than 50 residential units, measures such as the following be provided:
    - Travel plan including mechanisms for discouraging high emission vehicle use and encouraging the uptake of low emission fuels and technologies
    - A welcome pack available to all new residents online and as a booklet, containing information and incentives to encourage the use of sustainable transport modes from new occupiers.
    - EV car club provision within development or support given to local car club/EV car clubs.
    - Designation of parking spaces for low emission vehicles
    - Improved cycle paths to link cycle network.
    - Adequate provision of secure cycle storage.
    - Using green infrastructure to absorb pollutants.
    - Consider and research the benefits of introducing differential parking charges dependent on vehicle emissions and offering reduced costs for EVs

To promote charging at town centres and other key destinations, the Council will:

- Install EV chargepoints in council-owned car parks where demand is identified. Focus on charging 'hubs' in strategy for car park identification, in-line with KCC guidance, including investigating opportunities to develop wider 'mobility hubs'
- Ensure chargepoints are installed in high visibility, high footfall areas without compromising road or footway space
- Work with stakeholders to provide a balance of fast and rapid chargers in on and off-street locations. Rapid chargers are important for long distance travel, taxis and delivery/service vehicles which need to top up mid journey. Fast chargers are suited to local travel and sites with longer dwell times and will be the focus of SBC Time Scale Short – medium term

Objective 2: Designing sites that take into consideration accessibility concerns and other road users/pedestrians (Short – long term timeframe)
To fulfil this objective, the Council will:

- Use best practice principles and guidelines when selecting and designing sites to ensure a unified approach

- Ensure that if a chargepoint were to be installed, it would not cause an obstruction to any other road/footway user
- Actively discourage chargepoints which require cables across footways, as per the KCC guidance, to ensure pedestrian safety is not compromised
- Ensure footway widths meet Council standards and chargepoints are accessible
- Consider chargepoint design in each setting and ensure the infrastructure fits in with the surrounding streetscape
- Monitor demand and consider dedicated disabled charging bays in car parks, where appropriate
- Stay on top of emerging technologies and charging options as they develop, to ensure infrastructure remains fit for purpose and meets the needs and demands of users

Objective 3: Ensure the charging network has capacity for further expansion and is futureproofed (Long term timeframe)
To fulfil this objective, the Council will:

- Use the Parking SPD to encourage the installation of active and passive charging points in new developments to account for future growth and up-take
- Ensure chargepoint infrastructure and design are futureproofed through strong communication with chargepoint, including potential passive charging spaces
- Once chargepoints are installed, monitor usage data to ensure locations are suitable and chargepoints are being used - use parking data to make evidence-based decisions about future chargepoint locations futureproofed
- Embed capacity for EV infrastructure into other Highways and Transport projects and programmes and ensure these are aligned with the EV objectives as far as possible, to encourage and support further expansion
- Support partners to find solutions to grid capacity implications Be open to renewable energy projects within the borough to support the ever-increasing demand for electricity produced by EV uptake
- Work through KCC to engage with the energy utility companies to create a more resilient, smart and innovative local energy system to ensure Swale Borough Council have the energy we need, when we need it, at the right price and without any negative environmental impacts
- Encourage the installation of smart chargers to mitigate the impact on the grid
- SBC to ensure communication with the Distribution Network Operator (UKPN)

Objective 5: Lead by example through use of electric vehicles wherever possible for delivering council service and promoting the benefits (Short - medium term timeframe)
To fulfil this objective, the Council will:

- Install chargepoints in car parks and on all Council owned sites for use by council staff and visitors
- Understand the challenges faced by Swale Borough Council employees in the purchase of EVs
- Identify further locations to install EV chargepoints to benefit Swale Borough Council workers
- Explore grid implications of providing chargepoints for both council fleet and workers private vehicle
- Discourage the purchase of Internal Combustion Engine vehicles as part of the fleet (only to be purchased where market does not support electric alternatives)
- Encourage staff to switch to electric vehicles with promotion of grant schemes
- Using the Council's Commissioning Strategy to ensure that major contracts also utilise electric vehicles wherever possible.

Waverley Borough Council Draft Electric Vehicle Strategy 2021-2026

Objectives

For Waverley to remain a thriving and sustainable community in the future the following objectives were set out by the Council:
As the owner of car parks, properties and land, the Council will:

- Encourage the uptake of EVs amongst Waverley resident, visitors and businesses by the provision of an easily accessible, convenient and affordable public charging infrastructure across the borough.

- Consider interventions and incentives that will actively encourage a modal shift and make it more appealing to use EV over petrol and diesel vehicles on our roads.
- Respond flexibly to fast-paced developments within the EV sector, keeping residents and businesses up to date on those developments via the Waverley website.

As a local authority and employer, the Council will:

- Lead by example by using EV technology to reduce our environmental impact and work with our contractors and staff to do the same.

As a licencing authority, the Council will:

- Engage, inform and encourage Waverley taxi drivers to switch to a more sustainable vehicles over time.

  Work with SCC identify and install EV chargers at key locations suitable for taxi drivers.

As a planning authority, the Council will:

- Use the Surrey County Council Vehicular and Cycle Parking Guidance (January 2018) or any subsequently updated local guidance to ensure EV charging points are designed into new developments
- Use conditions on planning applications to ensure that EV charging points are delivered on new developments.

Actions

To encourage the update of electric vehicles in a proportionate and sustainable way whilst ensuring value for money the development of the Waverley EV charging network will be approached in a phased way. This will ensure that sufficient EV chargers are installed to promote the switch to electric vehicles whilst ensuring all residents are catered for.

- **Phase 1 - 2019-2021 -** Six rapid chargers (50kW) will be installed in Godalming, Haslemere, Cranleigh and Farnham. The number of rapid chargers in each hub will be determined by the size of the hub and the potential demand at that time. Further chargers will be installed as demand grows and in consultation with local Towns and Parish Councils.
- **Phase 2 – 2021-2022 -** Waverley working with SCC will install 10 on-street fast chargers, borough wide, in streets with no off-street parking. Sites will be considered based on essential criteria which includes, a request by a resident for a charger, a street with no off-street parking, availability of power supply, width of pavement, air quality in the area and existing parking restrictions.
- **Phase 3 – 2021-2022 -** Four fast chargers will be installed at long stay car parks in town centres and near railway stations which are used by commuters, local businesses and can be used by residents overnight. Where there are no suitable car parks but where there is a demand for EV charging for commuters and businesses Waverley will work with SCC and Town and Parish Councils to identify suitable sites and to install on-street fast chargers.
- **Phase 4 – 2022-2023 -** Waverley will work with Places Leisure to identify Leisure Centre car parks or neighbouring car parks that are suitable for chargers and the type and number that should be installed.
- **Phase 5 – 2023-2024 -** Waverley will work with SCC, Town and Parish Councils and other relevant landowners to identify suitable sites for EV chargers near our Parks and Countryside hubs. Availability of power supply will be critical and the option to power by renewable energy will be considered where there is a limited supply. The size and quantity will be assessed based on potential demand.

Targets

Key Commitments include:

- At least 30 locations of chargepoints by 2026
- To have at least 50% of all charging points to be charged by renewable or green energy
- New applications of Waverley's licensed taxis to be ULEV from 2023, and all applications ULEV by 2030.

Horsham District Council Electric Vehicle Chargepoint Strategy (2020)

In order to develop the EVCP network, the Council will:

- **Use council land effectively to support EVs -** The most significant contribution that the Council can make to encouraging the transition to electric vehicles is to use Council owned land to install chargepoints. The Council intends to use a model where car owners pay for parking as well as the use of the chargepoints. The aim is to encourage residents without off-street parking to be able to charge overnight at a competitive rate; therefore, encouraging take up of electric vehicles in these areas.

- **Support New Buildings Planning policies on EVs -** West Sussex County Council adopted updated Parking Guidance in August 2019. This includes guiding principles for EV chargepoints in new residential development schemes with an increase in the percentage that should be installed over time. Horsham District Council will use its planning powers to ensure that EV infrastructure is provided in new development. The Horsham District Local Plan (Regulation 18) which has been published for public consultation includes three policies that seek to ensure that EV chargepoints are provided. These are Policy 39 on sustainable, design and construction, Policy 26 on air quality and Policy 43 on parking. The wording in these policies is likely to change before the final version of the Plan is approved. As the approach in this Strategy is that most households will charge their vehicles at home it is important that new development include chargepoints where possible. There will, therefore, be an expectation that new single occupancy dwellings should incorporate an EV chargepoint. Suitable locations for EV chargepoints should be incorporated into the design of new developments.
- **Include EVs in Council development -** All new development on Council owned land will incorporate chargepoints appropriate to their location. They will also include spaces that are EV ready for development in multiple occupation (such as flats) or businesses. This means that cabling will be installed to reduce the costs of installing chargepoints in the future.
- **Take part in partnerships for a comprehensive and cohesive EVCP network -** The Council will work in partnership with other public sector organisations, such as West Sussex County Council, Parish Councils and other District and Borough Councils in the area to install chargepoints. West Sussex County Council adopted an EV Strategy in 2019 and its overarching aims complement the approach that the District Council wishes to take. Working in partnership with other public sector organisations will contribute to the aim of a comprehensive and cohesive network of chargepoints across the area which will make charging EV's simpler for residents and visitors. At this stage the Council has not worked with taxi and private hire owners over their requirements for electric chargepoints as their fleets move to all electric. However, this will form part of the Councils partnership approach.
- **Provide Incentives and Promotion of EVs -** The Council currently offers a large discount on new taxi or private hire licences for an EV. Options for further incentives to encourage EV taxis and private hire will be investigated by the Council. The Council will use its own media channels and work with partners to explain the advantages of EV and low emission vehicles. It will also keep residents, businesses and visitors updated as the chargepoint network in the area develops. The Government currently offers several grants to incentivise the uptake of EVs. The Council will promote these and also work with the public and private sector and with community groups to highlight the availability of these grants.

Sevenoaks District Council Low Emission and Electric Vehicle Strategy

The Low Emission and Electric Vehicle Strategy will assist the Council in achieving the following Net Zero 2030 actions:

- Promote low carbon travel
- Improve the electric vehicle charging network across the district
- Continue the transition to a zero-carbon emissions vehicle fleet wherever practicable

In order to achieve these actions, the Council will:

- Improve the District's electric vehicle network by increasing the number of charging points within Sevenoaks District Council owned car parks and on Sevenoaks District Council owned land.
- Support suitable schemes and projects to install charging points throughout the district.
- Ensure new developments make provision for electric vehicle charging through Local Planning Policy.
- Continue to work with Kent County Council, and other partners, to explore new charging options.
- Implement ways to reduce the carbon emissions from the fleet including through reducing fleet mileage and replacing the existing fleet with electric and low carbon alternatives, where feasible and as soon as possible.
- Support residents, businesses and communities to install suitable charging points including through providing information on available grants and funding opportunities.
- Encourage the replacement of traditional combustion engines and low emission vehicles with fully electric vehicles within the district.

Summary

Table 15Table 15 summarises the commitments within the TfSE region from all of the LTAs. This provides a holistic overview of the level of detail provided within current policy and strategy documents whether or not there is a specific EV or EVCI Strategy.

Table 15 Summary of EV related commitments

Topics/ Local authorities	Surrey	West Berkshire	West Sussex	Slough	Kent	Medway	Bracknell	Brighton & Hove	East Sussex	Isle of Wight	Portsmouth	Reading	Windsor & Maidenhead	Southampton	Wokingham	Hampshire
Published EV strategy	X	X	X	X	X											
EV uptake forecasts		25% of all vehicles to be ULEVs by 2030	17,890 by 2025, 44,048 by 2030							177 EVs registered per week from April 2020 to 2030						
EV Uptake targets		10% increase in number of ULEVs by March 2023, 5% of all vehicles to be ULEV by 2030	70% of all *new* cars to be EV by 2030												50% EVs registered in the borough by 2030	
Car Club EV targets	50% by 2025	60% by 2022														
Public Chargepoint delivery targets/ plans	X	50% increase in public	X	X	X	X	X	X	X	X	X	X	X	X	X	X

Topics/ Local authorities	Surrey	West Berkshire	West Sussex	Slough	Kent	Medway	Bracknell	Brighton & Hove	East Sussex	Isle of Wight	Portsmouth	Reading	Windsor & Maidenhead	Southampton	Wokingham	Hampshire
		EVCPs by 2023														
Public Fleet transition targets/ plan	X	25% of fleet ULEV/ BEV by 2022, 100% ULEV by 2030		X	X	X			X	X	X	X				
EVCP Forecasts		33 rapid EVCPs, 103 destination EVCPs, 1762 residential EVCPs by 2030	3,305 EVCPs by 2025, 7,346 by 2030		7,487 public chargers by 2030					At least 72 fast/rapid public charging points						
Priority areas for EVCP installation identified	X	X	X		X	X					X			X		
Strategy in production						X		X	X	X			X	X	X	X

Appendix 3: Fleet Electrification Guidance

The Energy Savings Trust Step-by-Step Guide to Electric Fleets[70]

The series of steps to fulfil when developing an EV strategy:

- Research the types of EVs and the models available - There are several different types of EV, the main types being battery electric vehicles and plug-in hybrids. The number of EV models on the market is growing rapidly every year. In particular, there is an increasing choice of electric vans with higher payloads and ranges and a greater variety of cars.
- Identify which vehicles have suitable mileage profiles - As well as calculating the daily average mileage, it is useful to gather information on journey patterns to assess suitability. Range anxiety remains one of the biggest barriers to EV adoption, however, most recent models have higher ranges and if the appropriate vehicle is chosen, EVs are likely to meet the needs of many fleet journeys.
- Think about your charging requirements - Chargepoints are categorised by their power which also results in variation in charging time. Increasing numbers of chargepoints are available on-street and in car parks in towns and cities, and rapid chargepoints are available at most service stations on the strategic road network. Electricity grid capacity of potential chargepoint sites must be considered, with the DNO's being able to advise on grid connection options and the costs involved for grid reinforcement. If the site does not have much spare grid capacity, this may dictate how many EVs can realistically operate and what charging or load management technology is required.
- Build the business case - Although EVs cost more than their petrol or diesel equivalents to buy or lease, it is crucial to look at the vehicle's whole life cost (WLC). A WLC analysis often shows that higher lease or purchase costs of EVs are offset by: Lower cost of electricity compared to petrol or diesel, lower servicing and maintenance and additional incentives, such as the various government grants and tax breaks.
- Engage with your drivers - Producing some clear communications and providing people with the opportunity to ask questions and helps to bust myths and identify and resolve any operational issues early on. Updating organisational policies is also essential so that the options and benefits are clear. Furthermore, offering a familiarisation or driver training course can help drivers to become more confident in driving and charging EVs, increasing the likelihood that the vehicles will be popular and achieve the cost savings identified.
- Monitor and share your success - Collect and analysing data on EV performance can help you assess if the predicted savings are being realised and can help build a case for further adoption of EVs and share the success stories.

Department of Transport's Zero Emission Fleets: Local Authority Toolkit[71]

For fleet electrification, local authorities need to:

- Identify which vehicles are suitable for replacement with electric vehicles (EVs) - The first crucial step for authorities is to gather data on how far individual fleet vehicles currently travel on a daily basis and their regular journey patterns. This will determine what is operationally feasible and impact the whole life cost analysis. Data will also be needed on journey patterns to assess consistency and how frequently the vehicle is driven over a certain mileage threshold. This can indicate how easy it could be to switch to electric without compromising service delivery. In addition to assessing mileages, fleets will also need to review operational requirements and the carrying capacity needed, such as the

[70] Energy Saving Trust, Step-by-Step Guide to Electric Fleets (2020). EST0018-001-EV-Guide-for-Fleet-Manager-WEB.pdf

[71] Department for Transport, Zero Emission Fleets: local authority toolkit (2022). Zero emission fleets: local authority toolkit - GOV.UK (www.gov.uk)

number of seats or weight or volume in commercial vehicles. For many cars, there are readily available and affordable electric equivalents. However, it is worth assessing the potential for downsizing light commercial vehicles, rather than automatically replacing them with an equivalent, due to the potential efficiency savings and the maturity of the market.

- Formulate a procurement strategy based on whole life costs - Once vehicles suitable for replacement with an equivalent zero-emission model have been identified, the next step is to evaluate the cost-effectiveness of the switch on a whole life cost basis to formulate a procurement strategy. For local authority fleets, the default should increasingly be that all petrol and diesel cars and small vans will be replaced with EVs as part of the fleet replacement cycle. Where vehicles under 3.1 tonnes are doing insufficient mileages to be cheaper on a whole life cost basis, it may be worthwhile analysing the utilisation rates of the fleet and assessing the potential for switching to e-cargo bikes or daily rental. For vehicles over 3.5 tonnes, the financial case for switching to electric can be weaker due to market maturity, even on a whole life cost basis. However, replacements with EVs could be justified in terms of the decarbonisation, air quality and reputational benefits for the local authority. It may also be worth considering extending the number of years a vehicle is kept on the fleet to spread the higher purchase cost over a greater mileage.
- Install chargepoints at council depots and review the options for charging - Vehicle journey patterns and the EV procurement strategy will inform the type, location and number of chargepoints required each year as the electric fleet grows. When installing chargepoints, local authorities may wish to consider providing 'passive provision' for further spaces. By laying the underground ducting and cabling for future chargepoints at the outset, chargepoint units can be installed flexibly in future, at lower cost with less disruption. The cost of connecting chargepoints to the UK grid varies significantly between sites depending on the existing electrical supply, site capacity and distance from the chargepoint to the connection point. Where there is insufficient capacity, an upgrade or reinforcement may be required by the distribution network operator, which can be expensive. Options to minimise costs include:
    - Reviewing a site's overall electricity requirements and implementing efficiency measures
    - Opting for slower chargepoints
    - Implementing active or dynamic load balancing, time-profiled connections and on-site assets, such as solar PV or battery storage.
- Implement supporting measures, such as driver and mechanic training - As EVs are still unfamiliar to many people, engaging with drivers early is important to ensure a smooth transition and a positive experience for all. Actions may include:
    - early, regular, transparent communications throughout the process
    - organising workplace events or online information sessions to discuss operational requirements and explain why EVs are being introduced
    - organising vehicle trials or test drives
    - placing simple, laminated sheets in shared vehicles with reminders about key EV and chargepoint features and frequently asked questions
    - familiarisation or driver training courses to help drivers gain confidence and maximise the use of EV features, such as regenerative braking
    - Servicing EVs is far simpler than petrol or diesel vehicles, which will lead to savings on consumables, parts and labour. As fewer staff may be needed to maintain and service fleet vehicles specifically, the local authority could combine teams or workshops with other public bodies or consider providing commercial EV servicing to the wider community.
- Encourage local businesses to switch to ZEVs - As well as transitioning their own fleet to electric, local authorities are well placed to support other public sector organisations and local businesses make the change in various ways: engagement events, try before you buy schemes, provide charging infrastructure, support last mile delivery organisations and raise awareness through communications of the Workplace Charging Scheme.

Scottish and Southern Electricity Networks Connecting your EV Fleet Guide[72]

Advice for Assessing a Site:

- Understanding Your Demand Profile - Before deciding on whether you need to upgrade your existing electricity connection to accommodate the additional load requirements from electric vehicle chargepoints, you will need to establish how much electricity you are currently consuming on your site (i.e., your Maximum Demand) and at what times.
- Optimising your Network Connection - Assessing your overall site requirements, rather than just looking at EV charging, may identify easy wins that can reduce your power requirements significantly. Reduction in your overall demand by achieving energy efficiencies and the introduction of demand side management technologies could also minimise, or in certain cases avoid, the need for reinforcement of the electricity network.
- Calculating your Fleet Charging Requirements - To calculate your EV charging requirements you will need to consider the following: The distance the individual vehicles needs to cover each day and over what timescale, When will your fleet need to be charged, Where will your fleet charge, The number of vehicles that you will need to charge at any one time, both now and in the future, what duration does your fleet need to be charged, and the likely charging patterns.
- Capacity Sufficiency - Once you know how much demand you are using, when this is occurring and the spare capacity you have available, you can determine whether your maximum peak demand, including the EV charging requirements, is likely to be below your existing Authorised Capacity.

Help given by Scottish and Southern Energy Network:

- Pre-application Meetings and Surgeries – It is always advisable to get in touch with your DNO as early in the process as possible to confirm your requirements prior to you submitting a connection application.
- Applying for a New or Upgraded Connection – Once you are ready to progress your plans you can either apply online or by e-mail for a new connection or a change to your existing connection.
- Designing your Connection – Depending on the stage you are at in your fleet decarbonisation plans, we have three design options we can offer: budget estimate, feasibility study/optioneering and formal offer.
- Delivering your Connection – As mentioned, you have the choice of asking your DNO to undertake all the connection works or engaging an ICP or IDNO to carry out all or part of the connection works, provided they are accredited to do so.

BVRLA Commercial Fleet Guidance[73]

It is vital that LTAs and other charging infrastructure providers can adapt their approach to meet the demands of growing and diverse fleet needs, to avoid a widening provision gap for some vehicle uses and types, in terms of:

- Access to the type of charging they need - The clearest gaps identified by fleets were in the provision of rapid charging in locations other than motorways. Where fleets found it most difficult to envisage the transition was where they needed to minimise downtime, therefore needing rapid charging in a convenient location. These concerns were strongest with the large numbers of commercial fleets where the vehicle is based at or returned to home, but the drivers do not have access to secure and private off-street charging. This need particularly applied to those fleets that were not frequently on motorways and might find themselves in rural locations providing vital services, but it also extended to supermarket delivery vehicles, who were on busy high streets or residential areas without rapid charging hubs.

[72] Scottish and Southern Electricity Networks Connecting your EV Fleet Guide. ssen-ev-fleet-guide.pdf
[73] BVRLA, Commercial Fleet Guidance (2022). BVRLAFleet-Charging-Guide-2022.pdf

- The reliability of the chargepoints - Fleets suggested that information about the availability, condition, and kind of charger available was integral to them being able to operate smoothly.
- The design of this infrastructure to suit all vehicles - Although no use cases are free from obstacles in switching to EVs, there are some fleets who have highly specific needs that will need to be addressed to ensure a smooth transition. Key to addressing this will be providing different types of charging across the different vehicle uses and ensuring that these reflect specific requirements (such as larger spaces, enhanced security etc).

LTAs are well-positioned to play a supporting role in monitoring and addressing provision gaps (either through the distribution of funds or through collaboration with the private sector) and ensuring that fleets are not left behind in the transition. The devolution of managing the roll-out of EV infrastructure to LTAs can allow for targeted and tailored approaches to local charging needs. However, this will increasingly need to balance risks of not accounting for cross-LTA needs, and the emergence of fragmented provision approaches. Therefore, it is recommended that:

- The Government should conduct a regular review on whether private CPOs are filling gaps in public charging provision.
- LAs and DNOs should work with the private sector to explore ways of mutualising the cost of grid connections.
- The Government should provide national guidance for LAs and CPOs on how different vehicle 'dwell times' impact chargepoint requirements.
- LAs should encourage the installation of more than one or two chargepoints in busy locations where reliability or redundancy is a key factor.
- LAs and CPOs should set enforceable service level agreements.
- LAs should require CPOs to provide dynamic data on chargepoint status and performance.
- Government funding should only be available for chargepoints that are secure and accessible for a variety of vehicle types.
- The Government should provide LAs with guidance on specific requirements for chargepoint users with disabilities.
- Government funding should incentivise chargepoints that support contactless or fuel card payments.
- LAs should have an obligation to engage with fleets on future as well as present chargepoint provision
- LAs should work with DNOs, CPOs, fleets, regional transport boards and other stakeholders to promote regular engagement and sharing of data.

The Role of Precise Fleet Data

Collating fleet data is an important aspect to fleet management as it provides vital information regarding the fleet vehicle usage and performance, fuel consumption, and vehicles storage (which is essential when planning EVCI requirements) are stored. Robust fleet data can track vehicle activity to optimise routes and minimise idling, monitor vehicle condition to support maintenance scheduling, and improve driver safety. A comprehensive dataset, complete with accurate and accessible data, can form the basis of advanced analytics to optimise performance and can enable an evidence-based approach when implementing new fleet interventions.

For EVs, special telematics have been introduced which can provide a flow of information like current and average speed, battery levels and even the journey routes. Recording information for commercial vehicles can present a well-rounded idea of the work that is carried out such as passengers transported, jobs completed, and loads carried. Further research is being done to enhance EV telematics to provide extra features which notify fleet managers of speeding, critical battery levels, unauthorised driving, and potential accidents.[74]

Accurate fleet data can inform the development and assessment of Fleet Performance Indicators (FPIs). This will enable the council to set ambitious targets and monitor progress towards achieving them.

[74] Trakm8, A Brief Guide to Electric Vehicle Telematics (2022). https://www.trakm8.com/articles/a-brief-guide-to-electric-vehicle-telematics-in-2022

Potential Vehicle Replacement

Error! Reference source not found. provides a list of common ICE vehicles used within public fleets and a list of suitable EV alternatives. Despite higher initial costs, transitioning to EVs can lead to long term savings. This is due to EVs having lower operational costs, a result of less maintenance requirements and a cheaper fuel source. Additional social benefits, although rarely observed on an individual basis, can have profound and valuable impacts on societal scales. Such as, improvements to public health and wellbeing because of better air quality in towns and cities.

Table 16 EV compared to ICE

Fuel type	Vehicle make	Vehicle type	Cost of vehicle	Range (Miles)	Capacity (kWh/ L)	Cost per mile* (pence)	Full capacity cost** (£)
Diesel	Vauxhall Vivaro	Van	£29,797	692	70	17.38	120.40
Petrol	Peugeot 208	Car	£19,080	463	44	15.29	70.90
Petrol	Ford transit	Van	£33,881	718	95	21.30	153.08
Petrol	ISUZU D-MAX	Pickup Truck	£21,999	658	76	18.59	122.47
Electric	Vauxhall Vivaro-e	Van	£35,028	143	50	9.09	13.00
Electric	Peugeot e-208	Car	£29,725	217	50	5.99	13.00
Electric	Ford E transit	Van	£42,695	196	68	9.02	17.68
Electric	Rivian R1T	Pickup Truck	£53,932	314	135	11.18	35.10

**Cost per mile (pence) = Total Litres x Fuel price / Number of miles.*
*** Full capacity cost (£) = Cost per mile (pence) x Total vehicle milage / 100*[75]

Due to the lack of data on cost per mile for each vehicle, average fuel prices were taken for petrol, diesel, and electricity, to ensure a coherent dataset was produced.

It is important to consider the typical daily mileage of fleet vehicles. It could be the case that, although the ICE alternative would have a maximum range of 500 miles, it only uses 100 miles per day. In this situation an EV, although having a shorter maximum range, would still be suitable and could be recharged overnight, ready for the next day.

Short team leasing is another option to reduce the initial costs of EV. Furthermore, by avoiding long-term commitments to specific vehicles, the council can trial different makes and models for specific purposes. Having shorter leases also enables the fleet to adapt quickly to new technologies and ensure optimum functionality and sustainability.

Currently, the market around larger EVs (e.g. refuse collection vehicles) is still relatively immature. While EV alternatives do exist, they can typically require dedicated DC charging facilities and present their own unique challenges. It is recommended that a dedicated study be carried out to determine a suitable electrification strategy for these vehicles.

[75] Trakm8, A Brief Guide to Electric Vehicle Telematics (2022). https://www.trakm8.com/articles/a-brief-guide-to-electric-vehicle-telematics-in-2022

Following a review of relevant fleet electrification guidance[76], the following steps were identified for a starting position for the South East.

Research EVs which match Demand Profile

There are several different types of EV, with a growing market resulting in increasing choice of electric vans with higher payloads and ranges, and a greater variety of cars. Local authorities first step to fleet electrification is to identify which vehicles have suitable mileage profiles. Gathering data on how far individual fleet vehicles currently travel on a daily basis and their regular journey patterns will determine what is operationally feasible and impact the whole life cost analysis.

In addition to assessing mileages, fleets will also need to review operational requirements and the carrying capacity needed, such as the number of seats or weight or volume in commercial vehicles. For many cars, there are readily available and affordable electric equivalents, therefore EV replacement should become the default in the fleet replacement cycle. For larger vehicles, replacements with EVs could be justified in terms of the decarbonisation, air quality and reputational benefits for the local authority. It may also be worth considering extending the number of years a vehicle is kept on the fleet to spread the higher purchase cost over a greater mileage. It is also worth assessing the potential for downsizing light commercial vehicles, rather than automatically replacing them with an equivalent, due to the potential efficiency savings and the maturity of the market. In some local authority fleets, there may be potential to introduce e-cargo bikes to replace vans, especially for journeys with low mileage and relatively small loads.

Consider the Charging Infrastructure Required

Vehicle journey patterns and the EV procurement strategy will inform the type, location and number of chargepoints required each year as the electric fleet grows. Chargepoints are categorised by their power which also results in variation in charging time. Installing on-site chargepoints provides convenience, however, the public charging network is growing rapidly. Energy Saving Trust generally recommends that at depots and similar sites, there is 1 chargepoint socket per vehicle. This is to make sure all are sufficiently recharged for the next working day and to allow pre-conditioning (heating or cooling while plugged-in) during summer and winter.

Electricity grid capacity of potential chargepoint sites must be considered, with the DNO's being able to advise on grid connection options and the costs involved for grid reinforcement. If the site does not have much spare grid capacity, this may dictate how many EVs can realistically operate and what charging or load management technology is required. In many situations, where overnight charging is possible and practical, higher investment in upgrades will not be worthwhile for car and van recharging. Before deciding on whether upgrades are necessary to accommodate the additional load requirements from electric vehicle chargepoints, the amount electricity currently consumed on the site and at what times must be established. When installing chargepoints, local authorities may wish to consider providing 'passive provision' for further spaces. By laying the underground ducting and cabling for future chargepoints at the outset, chargepoint units can be installed flexibly in future, at lower cost with less disruption.

Stakeholder Engagement

Producing some clear communications and providing people with the opportunity to ask questions helps to bust myths and identify and resolve any operational issues early on. Updating organisational policies is also essential so that the options and benefits are clear. Furthermore, offering a familiarisation or driver training course can help drivers to become more confident in driving and charging EVs, increasing the likelihood that the vehicles will be popular and achieve the cost savings identified. In regard to servicing, EVs are far simpler

[76] Energy Saving Trust, Department for Transport, A step-by-step guide to electric vehicles for fleets. https://energysavingtrust.org.uk/wp-content/uploads/2020/10/EST0018-001-EV-Guide-for-Fleet-Manager-WEB.pdf
Department for Transport, Zero Emission Fleets: Local Authority Toolkit. https://www.gov.uk/government/publications/zero-emission-fleets-local-authority-toolkit
Scottish and Southern Electricity Networks, Connecting your EV Fleet.
https://www.spenergynetworks.co.uk/userfiles/file/Connecting%20your%20EV%20fleet%20-%20final.pdf

than petrol or diesel vehicles, which will lead to savings on consumables, parts and labour. As fewer staff may be needed to maintain and service fleet vehicles specifically, the local authority could combine teams or workshops with other public bodies or consider providing commercial EV servicing to the wider community. As well as transitioning their own fleet to electric, local authorities are well placed to support other public sector organisations and local businesses make the change in various ways: engagement events, try before you buy schemes, provide charging infrastructure, support last mile delivery organisations and raise awareness through communications of the Workplace Charging Scheme.

Arcadis Consulting (UK) Limited
80 Fenchurch Street
London
EC3M 4BY

arcadis.com

TRANSPORT FOR THE South East

Transport for the South East
County Hall, St. Anne's Crescent
Lewes, BN7 1UE

tfse@eastsussex.gov.uk

www.transportforthesoutheast.org.uk

@TransportfSE @TransportForTheSouthEast

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