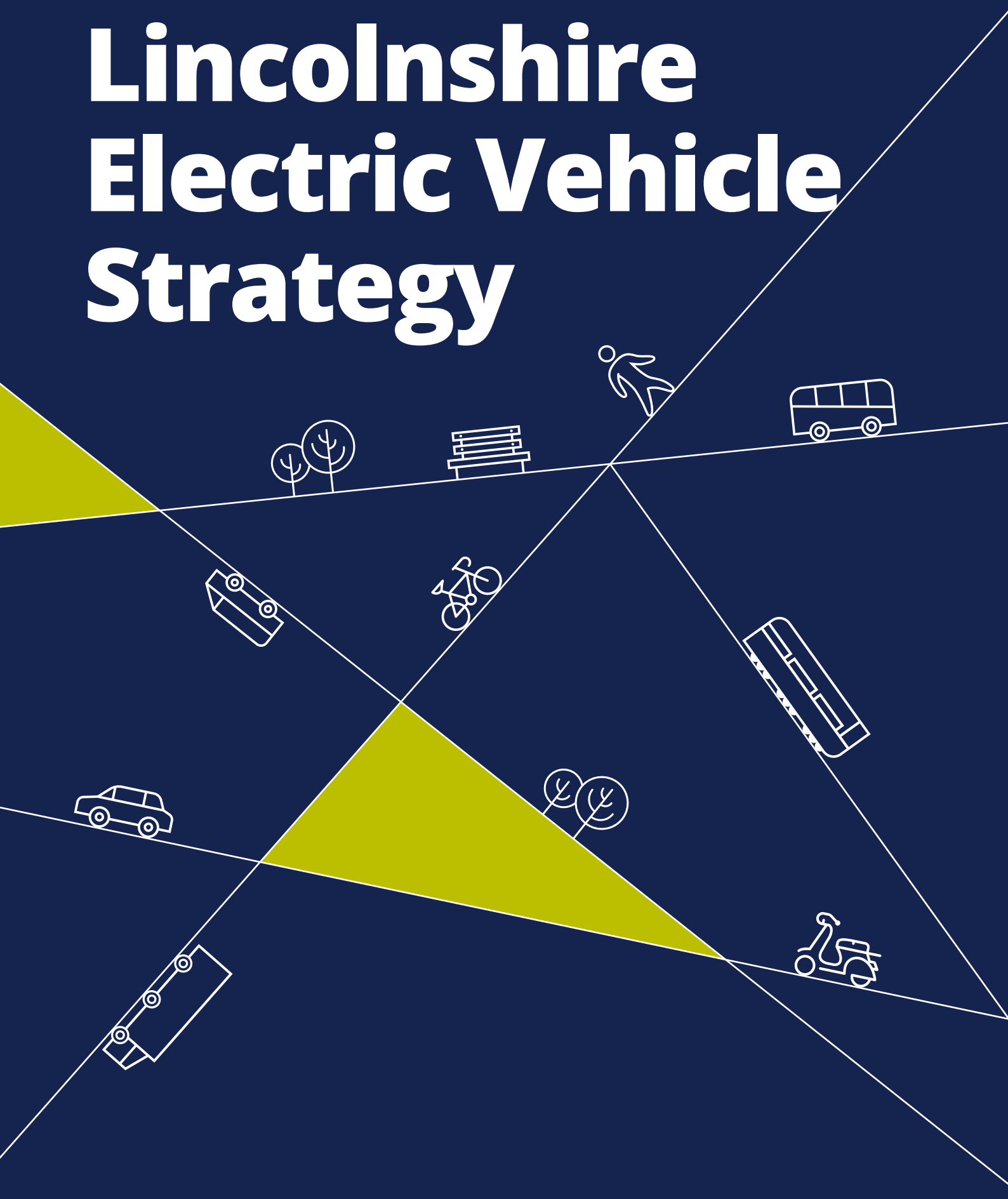
Lincolnshire
COUNTY COUNCIL
Working for a better future

Lincolnshire Electric Vehicle Strategy



Introduction

LCC, alongside North Lincolnshire and Northeast Lincolnshire have to identify measures each council and associated constituent District Councils can, or should, be taking to overcome barriers to Electric Vehicle Chargepoint (EVCP) rollout.

The ULEV strategy will be a document in its own right, alongside other policies and strategies such as the Lincolnshire electric bus strategy and other modal strategies, which will together form sub-strategies of the emerging LTP 5.

The ULEV Strategy process took a four stage approach:

- Baselining and research;
- Policy context and technical stakeholder engagement;
- Forecasting demand and charging requirements; and,
- Recommendations and reporting.

The ULEV Strategy has been developed using an extensive evidence base and has been informed by stakeholder input. The strategy also looked at different use cases for ULEVs including for freight and agriculture, along with other alternative fuels such as hydrogen and biogas.

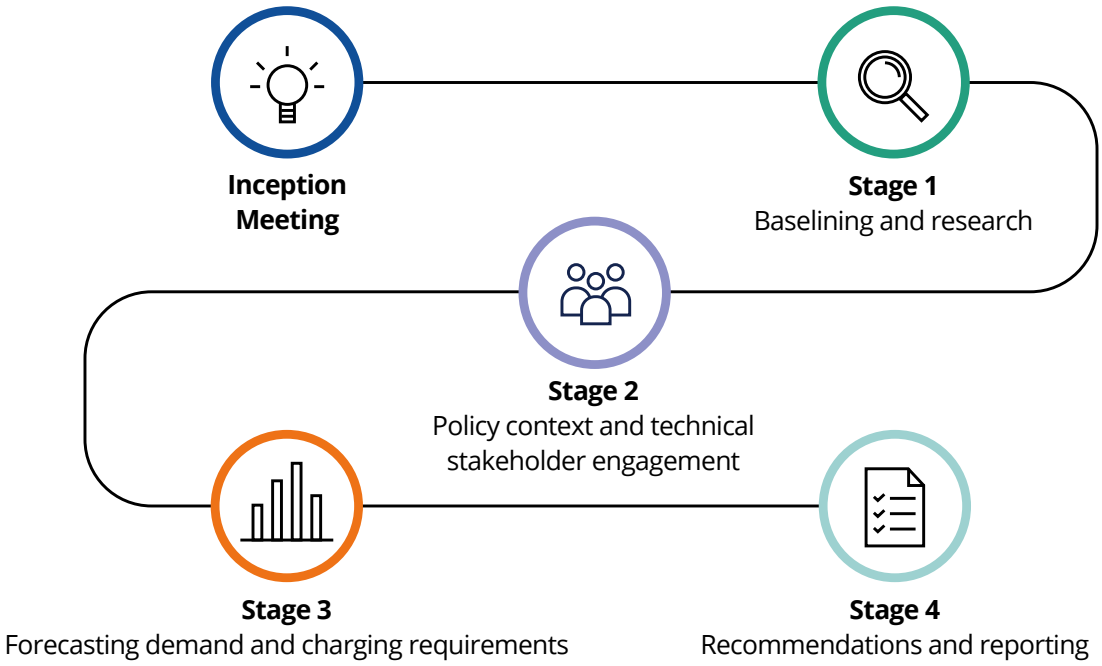
About this document

This document presents the structure and content of the ULEV Strategy, which has been developed involving engagement with a range of stakeholders from the LEP and local authorities.

Lincolnshire ULEV strategy

Strategy overview and approach

The ULEV strategy has been developed to support the overarching objectives of the Lincolnshire LTP 5. The ULEV strategy process took a four stage approach, set out in the figure below.



To help support decarbonisation of the transport system, LCC is interested in identifying any infrastructure related barriers that may slow the public's transition to electric vehicles (EVs).

The objectives of the study are to:

- Baseline the uptake of EVs across Greater Lincolnshire, and the provision of EVCPs.
- Review relevant national and local policy.
- Review the latest chargepoint technology types, charging rates supported, future charge point technologies and typical installation and operating costs.
- Consult with relevant stakeholders within Greater Lincolnshire to understand their requirements and preferences in terms of EV charging provision.
- Forecast EV uptake across Lincolnshire to 2030 to inform EVCP requirements and undertake a gap analysis to identify where the public sector potentially needs to intervene to plug gaps, to ensure a reasonable level of coverage is achieved so as to not slow EV uptake within the area.
- Identify infrastructure-related barriers to provision of EVCPs, providing recommendations to overcome any identified barriers.

The ULEV Strategy supports the overarching (draft) objectives of the Lincolnshire LTP 5, as follows:

- Economic growth;
- Greening of transport and climate change;
- Creating a thriving environment; and
- Promoting high aspirations.

This strategy presents a set of recommendations which aim to fulfil the above objectives and set out an action plan of how to facilitate the deployment of EVCPs across Lincolnshire.

Baselining and Research

EVs and EVCPs

Although there are EVCPs spread throughout the study area, gaps have been identified, particularly in the more rural areas of the county. Existing EVCPs centre around the main urban areas within each district. Across the area there are 235 publicly accessible EV chargers, of which 61 are rapid chargers. The level of charging provision varies across the area.

The most recent data shows that there are 2,963 ULEVs in Greater Lincolnshire, 1,307 (44%) Battery Electric Vehicles (BEVs) and 1,315 (44%) Plug-in Hybrid Electric Vehicles (PHEVs) with 13% unknown, this unknown could include alternative fuel ULEVs. There are differences in uptake across the various authority areas: 21% of all EVs in Lincolnshire county are registered in South Kesteven.

Research was undertaken into the different EVCP technologies available. A wide variety of technologies are available depending on the use case, and more charging options are expected to emerge over time. The report presents a series of considerations related to charging technologies, including on/off-street charging technologies, design principles for EVCPs and standards. The merits of smart charging are identified, and indicative capital and operating costs are presented. Consideration of future proofing and emerging mobility solutions are also presented. This research helped to inform the recommendations.

Grid capacity is often a key constraint on EVCP provision, and therefore high-level analysis of grid capacity was undertaken. Greater Lincolnshire has 185 primary substations, of which 94% are owned and operated by Western Power Distribution (WPD) whilst the remaining 4% belong to Northern Power Grid (NPG). The analysis showed that although a number of the primary substations are at or almost at capacity, there are some substations across the area with more capacity.

Alternative fuels

Plug-in electric vehicles, BEVs and PHEVs, are not the only ultra-low emission vehicle (ULEV) alternative to internal combustion engine (ICE) petrol and diesel vehicles, with a host of alternative fuels under development and already available on the market. The report looks at these alternatives at a national scale, summarising the key technologies and market trends.

At the time of writing, there are no hydrogen refuelling stations in Greater Lincolnshire. However, use of hydrogen is present across the study area. The closest is along the M1 in Rotherham, The Viking Link Project in Lincolnshire is a joint venture with Siemens Energy and GeoPura using hydrogen instead of diesel as an off-grid solution to power the site[1]. North Lincolnshire Green Energy Park plans to recover hydrogen from recycled waste for storage and use in decarbonising marine and road transport[2]. Additionally, future opportunities for hydrogen across Greater Lincolnshire arise from the Humber Port decarbonisation scheme H2H.

Given Greater Lincolnshire's substantial agricultural sector there may be good potential for promoting local biofuel production, particularly in terms of fuelling agricultural and freight vehicles. Biofuel production is already underway in parts of Greater Lincolnshire. BioGanix[3] located in North Lincolnshire is an organic recycling company specialising in anaerobic digestion, organic fertilisers and biofuels from food and beverage waste. Additionally, The Strong Energy Group[4], a leading provider of Biodiesel located in Louth produces biofuel from used cooking oils in previous food production. The infrastructure for biofuel production from agriculture and food and drink production already exists in Greater Lincolnshire. This strengthens the opportunity available to through the supply chain for sustainable alternative fuels in agricultural production and freight distribution.

Freight and agriculture

Given the presence of a large Agrifood sector, key freight corridors and port access in Greater Lincolnshire, freight and agricultural vehicles have been given specific consideration. The report maps out the market, looking at national trends around low-emission freight and agricultural vehicles, which may be deployed in Greater Lincolnshire in the future, and their potential infrastructure requirements.

The uptake of electric commercial vehicles has been dominated by the increased adoption of ultra-low emission vans due to the Low-Emission Freight and Logistics Trials (LEFT). LEFT was a £20 million government-funded programme (2017–2020), an additional £12 million was contributed by private sector trial participants, to cut emissions and improve air quality by focusing on emissions-busting technologies for trucks and vans[5].

However, electric and hydrogen technologies for larger freight vehicles are already being trialled. In March 2021, the Government announced £54 million of funding for electric trucks and hydrogen buses. £31.9 million of this funding will be used to develop electric propulsion systems for heavy goods vehicles in Cwmbran, Wales.

Alternative fuel agricultural vehicles are currently in development, but the technology has not penetrated the market on a wide scale. The first all-electric tractor purchased in Great Britain was by a farmer on the Island on Sark in the Channel Islands[6]. The Farmtrac 25G model from India is powered by a 21kWh battery can operate on an average of 6-7 hours before recharging. The capacity of the tractor is enough to replace diesel 41-50 and 60+ model equivalents. The shift to hydrogen agricultural vehicles is lower across the UK than that of electric options. In 2020, China launched the first hydrogen fuel cell electric tractor model ET504-H. The model also includes 5G mobile communication, is self-driving and can be remotely controlled[7].

Policy context and technical stakeholder engagement

Policy context

The report presents a policy review undertaken to capture the strategic context for investment in EVCPs, summarising relevant legislation and national guidance, policies, commitments and targets.

A policy review looking at EV related policies and plans for each of the local authorities within Greater Lincolnshire was undertaken. When referring to policies or plans, this is based on adopted policies or plans rather than drafts or general statements of support. When reviewing the policy position, it should be understood that county authorities are not responsible for Local Planning policy. This responsibility lies with lower tier district and borough authorities; hence counties generally do not have requirements related to EVCP provision in new developments. Lincolnshire County Council however have expressed the need in taking a 'lead by example' approach to ULEVs throughout Lincolnshire which will be reflected in upcoming updated documents.

Stakeholder engagement

A key aspect of the study was to engage with officers from local authorities within Greater Lincolnshire, to understand their existing plans and ambitions for promoting EV uptake. This includes any future plans for charging infrastructure, opportunities and barriers to EV uptake, as well as any issues or challenges encountered when implementing EVCPs to date, and what the county council could do to support them. The study has also sought to capture their preferences and requirements in terms of chargepoint deployment and delivery models, to inform the subsequent recommendations.

Key findings from engagement with the authorities include:

- EVs and EVCPs are not prominent in current policy across the county. However, there is a general consensus that EVs and EVCPs need to increase in prominence;
- The county council stated that they want to lead by example and influence the authorities through Local Plan allocations;

- 50% of authorities that were engaged stated that there were currently no further plans to deploy EVCPs other than what has already been implemented;
- The most cited response for barriers to EV adoption were technology, cost and range anxiety;
- 80% of the authorities highlighted grid constraints as the key barriers for EVCP implementation;
- Rapid chargers were recognised as being important for use at short stay destinations such as larger trunk roads running through area;
- There was a consensus around the need to have a mixed approach, depending on dwell time, implementing rapids where needed, slow at homes/residential locations and fast chargers at most other locations; and,
- With regards to delivery models, most authorities are open minded and will be led by industry. With some preference towards private sector involvement.

Forecasting demand and charging requirements

WSP's in-house EV:Ready tool was used to drive forecasts for future EV uptake. EV:Ready enables sophisticated EV uptake forecasting and scenario testing. It generates granular forecasts at a neighbourhood level, accounting for highly localised spatial variations in the key determinants of EV uptake rates, including consumer profiles, socio-demographics, the availability of off-street parking, vehicle ownership, vehicle sales and turnover rates and vehicle ownership trends.

The broad approach taken to forecasting EV uptake, and the subsequent requirements for EVCP provision is summarised in the figure to the right.

1. Baseline the number of registered EVs and existing EVCPs; the proportion of households reliant on on-street parking; and general levels of vehicle ownership by household.
2. Review national level forecasts of EV uptake and consider vehicle turnover trends.
3. Identify localised propensity to purchase EVs, based on consumer profiles and socio-economic, demographic and lifestyle types.
4. Forecast EV uptake, taking account of typical vehicle ownership levels.
5. Forecast public EVCP requirements to support forecast EV uptake.
6. Gap analysis where public sector intervention may be required.

The forecast demand in a scenario where there is lower EVCP provision (fewer EVCPs per EV), suggests that in the short-term there is only a slight shortfall in the supply of chargers in Greater Lincolnshire relative to demand. As such there was only an immediate requirement for seven additional publicly funded chargers. This rises to 957 by 2030. However, it is important to recognise that in this scenario, it is assumed that chargepoints are deployed optimally and achieve high utilisation, with greater increases in the average charge rates (kW/h) also assumed. It would also serve to provide a more limited minimum baseline coverage of EV charging provision, and more high-powered recharging in fewer locations. It also assumed upgrading the power outputs of existing legacy chargers.

Conversely, the forecast demand for the number of chargepoints in the higher EVCP scenario (more EVCPs per EV), is significantly higher than the mid-range estimate, with a requirement for 3,740 additional publicly funded chargers by 2030. In this scenario, it is assumed chargepoints are deployed more widely and used less intensively, with more modest increases assumed in the average charge rate (kW/h). This would equate to a more dispersed form of recharging at destinations.

A summary table below of public EVCPs by local authority area highlights the forecast numbers.

Local Authority	Existing EVCPs (2021)[8]	2020			2025			2030		
		Low	Mid	High	Low	Mid	High	Low	Mid	High
Greater Lincolnshire	235	243	335	507	1,044	1,857	2,642	2,106	3,394	7,708
North East Lincolnshire	19	28	39	59	124	220	313	252	406	923
North Lincolnshire	18	36	50	75	159	282	402	323	521	1,184
Lincoln	49	16	22	33	70	124	177	144	232	527
East Lindsey	47	33	45	68	143	254	362	290	468	1,062
South Kesteven	37	38	52	78	155	275	391	304	491	1,114
Boston	30	14	19	29	62	111	158	129	207	471
West Lindsey	13	25	34	51	103	183	260	205	330	750
North Kesteven	12	32	44	67	132	235	335	261	420	954
South Holland	10	22	30	46	97	172	245	197	318	722

Based on the analysis of the potential demand for public EV chargers, and which sites are more likely to come forwards through private sector chargepoint deployments, an assessment can be made of the areas where gaps in chargepoint availability are more likely to arise. The results indicate the areas where gaps in the chargepoint network are thought most likely to occur, including:

- Remote areas with limited demand, but still requiring baseline provision to cater for low level demand, e.g. tourist sites/routes;
- Rural or secondary routes with moderate levels of demand, but with fewer destinations (retail stores, food outlets etc.) to serve as a platform for chargepoint rollout;
- Areas with greater reliance on on-street parking and few amenities with the potential to host local charging hubs;
- Primary routes with high demand and delivery constraints, particularly in areas where there are sections of road with few destinations to readily cater for chargepoints, or where there are grid constraints making sites commercially unviable;
- Areas of high demand with delivery constraints, including high installation costs/grid constraints which pose a barrier to delivery; and,
- Areas with more constrained grid capacities or more remote from a primary substation.

Crucially, in order to enable LCC, the unitary authorities and district councils to plan effectively for meeting future EV charging requirements, a reasonable estimate of the number of publicly accessible chargepoints that are required and may not be delivered by the private sector alone, is essential for forward planning.

Based on the feedback of CPOs and the key parameters informing a sites commercial viability, it was estimated that approximately 50% of publicly accessible chargers delivered by 2030 may be privately funded. This is based on the share of chargers delivered by the private sector rising from around 20% in 2020 to 60% by 2030, as demand increases, costs fall, and commercial viability improves.

Based on the forecast uptake of EVs in Lincolnshire, the requirement for publicly accessible charging infrastructure, and an assessment of the likely areas of focus for private sector investment, the mid-range estimate is for a requirement of 1,724 additional publicly funded chargepoints by 2030, assuming a blend of both rapid and fast chargers.

Forecast Publicly Funded EVCP Requirement	2020	2025	2030
Lower EVCP Provision	7	532	957
Mid-range EVCP Provision	80	1,069	1,724
Higher EVCP Provision	217	1,605	3,740

Recommendations

The recommendations from this study draw on the findings of the baseline assessments and research, stakeholder engagements, forecasting and analysis and soft market testing. The recommendations were developed under 11 categories:

1. Accelerate chargepoint deployment to promote EV uptake;
2. Focus on establishing good chargepoint coverage and plugging gaps;
3. Deliver the right solution for the right location;
4. Make the most of available funding opportunities;
5. Take a balanced approach to delivering charging infrastructure, inviting private investment but retaining control;
6. Let the private sector take the strain and carry the risk where possible;
7. Collaborative working across Greater Lincolnshire with key stakeholders;
8. Decarbonisation of freight and agriculture;
9. Promotional activities and awareness raising;
10. Increase EV prominence in local policy; and,
11. Decarbonisation of Buses and Taxis;

There are 33 total recommendations that support the 11 categories set out above. These are displayed in the action plan. The action plan also includes:

- The role of authorities – lead, enable, explore, encourage, or require;
- Action by (i.e. who is to lead); and,
- Recommended timescale.

EV action plan

Recommendation/action	Aims	Role	Action by	Timescale
Accelerate charge point deployment to promote EV uptake.	Adopt targets to work towards delivering the mid-range scenario (3,394 EVCPs by 2030 across Greater Lincolnshire) as the central estimate for planning purposes.	Lead	All authorities	By 2030
Focus on establishing good chargepoint coverage and plugging gaps.	Prioritise car park sites on the basis of forecast demand and where gaps in private sector provision are anticipated.	Lead	All authorities	Within 12 months
	Feasibility studies and further analysis for preferred sites.	Lead	All authorities	Within 12 months
	Introduce charging solutions to cater for areas without access to off-street parking.	Lead	Highway authorities	Within 3 years

EV action plan				
Recommendation/action	**Aims**	**Role**	**Action by**	**Timescale**
Deliver the right solution for the right location.	For most car parks a number of standard/fast chargers (7-22kW), capable of smart charging and load management, with rapids (50-150kW) deployed where dwell times are shorter.	Require	All authorities	On-going
	Standard/fast chargers, these should be delivered in clusters where possible.	Require	All authorities	On-going
	Rapid chargepoints should be future proofed to support higher charge rates in the future, preferably at least 150kW.	Encourage	All authorities	On-going
	Passive provision for additional chargers should always be considered as part of the initial installation.	Require	All authorities	On-going
Make the most of available funding opportunities.	Take the opportunities to secure grant funding where available.	Explore	All authorities	On-going
	Identify a Chargepoint Operator (CPO) prior to any ORCs funding bid submission.	Lead	All authorities	Within 12 months
	Prepare a strategic outline business case(s) for future funding rounds to deliver a forward programme of deployments.	Lead	All authorities	Within 12 months
Take a balanced approach to delivering charging infrastructure, inviting private investment but retaining control.	Attract public sector grant funding, alongside private sector investment to expand the local charging network.	Lead	All authorities	Within 12 months
	A concessionary scheme is likely to be the best fit for Greater Lincolnshire.	Explore	All authorities	On-going
	A soft market testing exercise with CPOs.	Lead	Lincolnshire County Council	Within 12 months

EV action plan				
Recommendation/action	**Aims**	**Role**	**Action by**	**Timescale**
Let the private sector take the strain and carry the risk where possible.	Allow the private sector to take the strain in providing EV infrastructure where they are willing to do so.	Enable	Private sector	On-going
	A balance of private and public sector EVCP operation should be maintained, with more attractive EVCP sites being parcelled up with less attractive sites.	Lead	All authorities in conjunction with the private sector	On-going
	Engage with private sector suppliers to deliver on-route rapid chargepoints along key routes where there is forecast high demand.	Lead	All authorities in conjunction with the private sector	Within 12 months
Collaborative working across Greater Lincolnshire with key stakeholders.	Consider running an area-wide procurement exercise to identify a single supplier, or potentially a small number of suppliers.	Lead	county and unitary authorities	Within 12 months
	Establish an EV forum through which officers and representatives could come together to discuss EVCPs. Regular engagement and close working/information sharing with the DNOs is essential.	Lead	All authorities	Within 12 months
	We recommend the Lincolnshire group engage with the Midlands Connect team to make use of materials prepared by Midlands Connect and ensure that if Midlands Connect are applying for funding that Lincolnshire can benefit from additional funding that Midlands Connect can secure.	Explore	Lincolnshire County Council	Within 12 months
Decarbonisation of freight and agriculture.	Monitor market developments and look out for funding opportunities.	Lead	All authorities	On-going
	Engage with local operators and other key stakeholders (DNOs etc) to establish a smetc. local interest group and position for future trials/schemes.	Lead	All authorities	Within 3 years

EV action plan				
Recommendation/action	**Aims**	**Role**	**Action by**	**Timescale**
Promotional activities and awareness raising.	Promote the OZEV Workplace Charging Scheme and Electric Vehicle Homecharge Scheme to residents of Greater Lincolnshire.	Lead	All authorities	On-going
	Establish a webpage or include features in newsletters highlighting local chargepoints and the available grants, which could also direct them to a webpage register interest in an EVCP.	Lead	All authorities	On-going
	Engage with wider stakeholders to deliver EV chargepoints at other key destinations including supermarkets and train stations.	Lead	All authorities	Within 12 months
	Engage with tourist destinations and explore tourism opportunities associated with EV.	Lead	All authorities	Within 12 months
Increase EV prominence in local policy.	Ensure policy documents make the strategic case for supporting EV uptake and commit to targets and standards for EVCP provision.	Lead	All authorities	When policy renews
	Review the fleets of each authority to identify opportunities to electrify the fleet.	Lead	All authorities	Within 12 months
	Future proof new developments with EV parking standards and requirements for developers to incorporate EVCPs or passive provision.	Require	Developers	On-going
	Review the scope of introducing emissions linked parking charges.	Explore	Unitary and district authorities	Within 12 months
Decarbonisation of buses and taxis.	Undertake a feasibility study to investigate the potential for e-buses across the Greater Lincolnshire area.	Lead	County and unitary authorities	Within 12 months
	Engage with bus operators, taxi companies and other key stakeholders to understand appetite for electrification.	Lead	All authorities	Within 12 months
	Engage with taxi operators to ensure there is sufficient charging provision for taxis and private hire vehicles.	Lead	All authorities	Within 12 months

References

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Glossary

CRP	Community Rail Partnership. A group of local people, mostly volunteers, who promote and undertake small scale works at local stations of lines.
DfT	Department for Transport – the Government body who buy most train services and fund Network Rail.
ECML	East Coast Mainline, line accommodating fast services between the north and London passing through Doncaster and terminating at London Kings Cross.
EMR	East Midlands Railways – local and regional services across the East Midlands and Long-distance high s peed services to London along the Midland Mainline.
GBR	Great British Railway – the proposed future organisation to run England Railway, taking over from Network Rail, DfT and TOC's. See Rail White Paper.
LCC	Lincolnshire County Council.
LNER	London North Eastern Railway. Operate Long-distance high-speed services to London along the East Coast Mainline.
LTP 5	The Lincolnshire County Council's 5th Local Transport Plans (lasting 5 years to 2028/29).
MML	Midland Mainline, line accommodating fast services between Yorkshire and London, starting at Sheffield and Nottingham/Lincoln and travelling to London St. Pancras via Leicester.
Northern	Northern Trains – local and regional train company operating services across the north of England.
ORR	Office of Rail Regulation who oversee Network Rail's performance and report back to DfT.
RTB's	Regional Transport Bodies, including Transport for East Midlands/East Midlands Councils (TfEM/EMC), Midlands Connect, Transport for the North (TftN).
TOC	Train Operating Company.
TPD	Trains per day.
TPX	Transpennine Express – inter-regional train company operating services across the north of England and into Scotland.
XC	Cross Country – a train operator serving long-distance routes excluding London.
COVID-19	Coronavirus pandemic of 2019/20.
LTB	Local Transport Boards.
RAP	Route Action Plan.
HIAMP	Highways Infrastructure Asset Management Plan.
SEA	Strategic Environmental Assessment.
SA	Sustainability Appraisal .
GVA	Gross Value Added.
TfL	Transport for London.
LENNON	Latest Earnings Networked Nationally Overnight.
ATC	Automatic Traffic Count.
EV	Electric Vehicle.
DECC	Department of Energy and Climate Change.
SUEs	Sustainable Urban Extensions.
UKCRF	UK Community Renewal Fund.
UKSPF	UK Shared Prosperity Fund.
LUF	Levelling Up Fund.
LATS	Local Area Transport Strategies.
LCWIP	Local Cycling and Walking Infrastructure Plan.
ROWIP	Rights of Way Improvement Plan.
PRoW	Public Rights of Way.
CPO	Chargepoint Operator.
EVCP	Electric Vehicle Charhepoint.
BAME	Black, Asian and Minority Ethnic groups.
NTS	National Travel Survey.
CBSSG	COVID-19 Bus Services Support Grant.
JSNA	The Joint Strategic Needs Assessment.
DLUHC	The Department for Levelling Up, Housing and Communities.
SIDP 21	Strategic Infrastructure Delivery Plan 2021.

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