Devon County Council

Electric Vehicle Charging Strategy

Devon County Council

wsp

Executive summary
Report overview (1/2)

Background

Devon County Council (DCC) declared a climate emergency in 2019 and helped to publish the **Devon Carbon Plan** which sets out what needs to be done for the region to meet the climate emergency challenge.

The decarbonisation of transport in Devon is a crucial part of this response, as the sector represents a large proportion of Devon's emissions. The plan sets out that Devon will push for the use of more renewable energy, active travel and facilitate the uptake of electric vehicles (EVs).

EVs play a significant role in the ability for Devon to meet emissions targets, and a key barrier to the uptake of EVs is availability of suitable charging infrastructure. The Devon Electric Vehicle Charging Strategy aims to help all residents and visitors **overcome barriers to EV adoption and increase access to suitable infrastructure**.

The **Strategy will form part of a suite of documents** that will feed into the emerging Local Transport Plan 4 (LTP). Focusing on decarbonisation, LTP 4 will draw together Local Cycling and Walking Infrastructure Plans (LCWIPs), Devon's Bus Service Improvement Plan (BSIP), rail plans for Devon Metro, as well as plans for electrification and charging infrastructure. In alignment with the Devon Carbon Plan, **this Strategy will help DCC to ensure that increased electrification forms part of the response to the climate emergency**. The Strategy will also be instrumental in leveraging funding from Government for new EV infrastructure.

It is important that DCC has an evidence-based approach, to be best positioned to receive new capital funding opportunities. **This EV Strategy provides a summary of EVs in Devon, assesses the policy context and forecasts EV uptake and Electric Vehicle Charge Point (EVCP) demand to 2030.**

The transition to zero-emission vehicles will not be the only answer. A shift to public transport and active travel remain vital to achieve the Devon goal of 50% emission reduction by 2030 and Net Zero by 2050. Nevertheless, many Devon residents rely on cars and vans, and local authorities have a role to play in enabling and accelerating the uptake of electric vehicles (EVs).

Current position

At present, the number of ULEVs registered for the first time is rising across the UK and in Devon. **Between 2016 and 2021, there was an 870% increase in the number of ULEVs registered in Devon**, a large proportion of which are based in Exeter.

In parallel to the growth in the uptake of vehicles, the EVCP market is evolving rapidly. **The number of publicly accessible EVCPs in Devon has increased at a rapid rate** and is expected to continue to increase in coming years. **Devon currently has a strong number of publicly accessible EVCPs per 100,000 people, when compared to other UK Local Authorities**.

A large proportion of EV charging currently happens at home, but as more households without access to off-street parking purchase or lease EVs, and vehicle ranges increase, **the need for publicly accessible EVCPs grows**.

Policy context

National policy supports the role of the public sector in enabling the transition to EVs. In 2021, the government published a Net Zero Strategy, setting out proposals for decarbonisation, including an **end to the sale of new petrol and diesel cars from 2030**. In addition, in March 2022, the Department for Transport (DfT) published an **Electric Vehicle Infrastructure Strategy**.

EVs align to **local policy**, including the **Devon Carbon Plan**, DCC's **Electric Vehicle Charging Position Statement** and **Devon Transport Infrastructure Plan**. EVs can also provide Devon with social benefits, such as job creation and enabling green tourism.

The EV strategy uses insight from stakeholders, which has highlighted the need to **work with the private sector to ensure that EVCPs are available fairly across the county** and the need for guidance to ensure that **those without off-street parking can safely charge vehicles**.

DCC also need to ensure that those using EVCPs have a positive, reliable and fair experience. This includes ensuring that those with disabilities or those living in rural areas have **equitable access to EVs**.

Executive summary
Report overview (2/2)

EV uptake forecasting

A forecast of future EV uptake has been completed up to 2035, which shows that by 2033, EVs are expected to account for the majority of the fleet in Devon for the first time.

The demand for **publicly accessible charge points up to 2030 has also been estimated**. By 2030, there is a forecast need for 4,000 fast chargers and 600 rapid chargers in Devon, in a mid-range scenario.

Whilst the **private sector will provide a proportion of the EVCP infrastructure required**, there will remain areas where the public-sector will need to intervene to ensure equality of provision. This includes ensuring that those without off-street parking can access EVCPs. **Figure 39** on page 46 provides a map of the forecast gaps between the estimated demand and supply of charging infrastructure.

Devon County Council will **intervene in areas where the private sector does not wish to invest, to achieve DCC's policy goals and ensure suitable access for all**.

Delivery of EV infrastructure

There are various ways that DCC can support EV adoption, and a **range of delivery models exist for the roll out of EVCPs.**

DCC are currently working with the private sector to operate a **concessionary model**, which provides a good balance of **risk and control**. In future, DCC can look to build on the existing approach and **continue to explore opportunities for grant funding for investment in EVCPs**, including the upcoming LEVI scheme.

Recommendations

The EV strategy outlines several levers that DCC can take to support the uptake of EVs in Devon:

- Accelerate charge point deployment to promote EV uptake
- Focus on residential charging: fill the gaps in the private sector residential provision and intervene to ensure that there are 2,000 publicly accessible EVCPs in Devon by 2030 (2,000 publicly accessible EVCPs that are provided by public sector intervention, in addition to EVCPs provided by the private sector).
    - Provide on-street residential chargers
    - Test on-street residential pavement gullies
    - Deliver off-street residential hubs
- Plug gaps in private-sector destination and intermediate charging provisions
- Follow best practice design principles
- Leverage private sector funding, but retain control through a concessionary approach with a private sector delivery partner
- Seek national funding to support EVCP aspirations
- Leverage scale through Devon-wide funding applications and procurement
- Lead on local district co-ordination
- Monitor EV uptake and charge point provision
- Ensure EV design considers diverse user needs
- Raise public awareness, including of the peer-to-peer charging network
- Work with electricity network companies to improve capacity within the network

Executive summary
Report structure

Report structure and context

This report is structured in several sections.

- The initial section provides an introduction to the report. This includes the objectives of the study and the four-stage approach used.
- **Section 1** presents a policy review and summarises relevant national and local policy.
- **Section 2**
  - **Section 2A** summarises the baseline position of ULEVs / EVs and EVCPs in the UK and Devon, including the number of vehicles registered, the number of publicly accessible charge points and the distribution of council assets across the county.
  - **Section 2B** provides an overview of the types of charge points available, how they are used in different locations and design principles for EVCPs. This section provides details about 'trailing cables' for Devon residents and visitors without access to off-street parking. It also provides an overview of electricity connection considerations, including feedback from Western Power Distribution.
- **Section 3**
  - **Section 3A** provides a forecast of future EV uptake / ownership across Devon, considering the propensity of residents to switch to EVs, car ownership levels, and access to off-street parking.
  - **Section 3B** forecasts the requirements for EVCPs in Devon and provides indicative forecasts for the need for the public sector to intervene in the roll-out of EVCPs.
  - **Section 3C** outlines the potential delivery models that can be used to deliver the necessary supply of EVCPs.
- **Section 4** provides a conclusion and identifies a set of recommendations, drawing on the findings from the previous sections.

Figure 1 Devon County Council Area

Introduction

Study background and approach

Introduction
Background

Background and approach

Devon County Council (DCC) have ambitions to reduce carbon emissions in the area, and the **Devon Carbon Plan** outlines a target for Devon to **achieve net zero carbon by 2050** at the latest, with an interim target of a 50% reduction by 2030 below 2010 levels.

Similarly, Devon's **Local Transport Plan** (2011 26) outlines an objective to **provide safe, sustainable and low carbon transport choices**. The Strategy will form part of a suite of documents that will feed into the emerging updated Local Transport Plan (LTP). Focusing on decarbonisation, LTP 4 will draw together Local Cycling and Walking Infrastructure Plans (LCWIPs), Devon's Bus Service Improvement Plan (BSIP), rail plans for Devon Metro, as well as plans for electrification and charging infrastructure. In alignment with the Devon Carbon Plan, this Strategy will help DCC to ensure that increased electrification forms part of the response to the climate emergency.

Transport forms 31% of Devon's Greenhouse Gas (GHG) emissions. Reducing and changing how people travel in Devon will have an impact on achieving the aims of the Devon Carbon Plan. Whilst the priority is to encourage mode shift towards active travel and public transport, it is recognised that there is a need for some trips to be made by private vehicles. **Where car use is necessary, there is an opportunity to accelerate the shift from petrol and diesel internal combustion engines (ICE) to EVs.**

It is recognised that barriers to a transition to EVs are the lack of a comprehensive charging network and the purchase price of the vehicles.

In 2021, DCC surveyed residents to understand barriers and drivers for EV uptake. This demonstrated that whilst there is interest from the public in switching to cleaner vehicles, purchase price and access to charge points were recognised as key barriers to purchasing an EV.

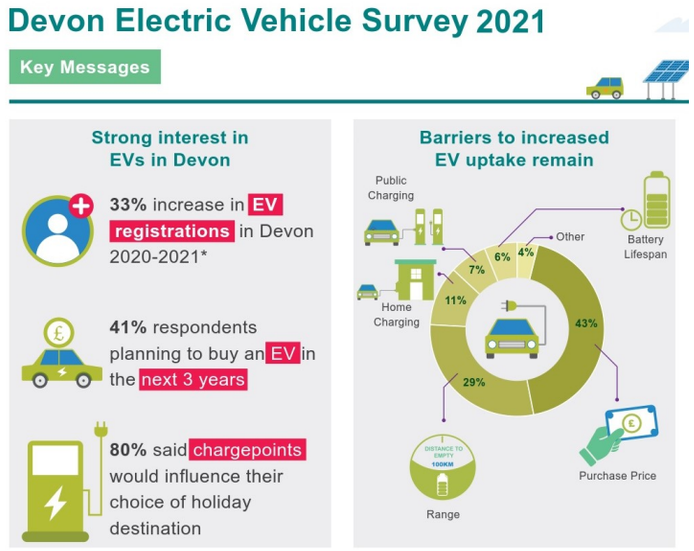
Whilst the cost of a new EV is expected to reach parity with other vehicles by 2027, Local authorities can help residents and visitors to overcome barriers surrounding charge point access. **Local authorities**, including County and District Councils have a **variety of mechanisms for influencing EV uptake**; as custodians of the local road network, the authors of policy, as planning authorities, land owners and fleet owners. To help achieve these ambitions, DCC commissioned WSP to prepare an Electric Vehicle Strategy. The EV Strategy aims to understand how the uptake of electric vehicles can be accelerated in Devon. The EV Strategy doesn't cover the decarbonisation of freight, as this is covered in the **Freight Strategy for the South West**.

The Strategy aims to help achieve the following:

- **Reduce carbon emissions** in Devon
- **Accelerate the uptake of Electric Vehicles** in Devon, within the context of an overall shift away from use of the private car
- Help ensure that the transition to Electric Vehicles is **accessible for all and equitable**
- Maximise the **social value and community benefits** associated with the transition to EVs
- Maximise the contribution EVs can make to the **local economy**, including through increased tourism
- **Contribute to the Council's goal to achieve carbon neutrality** for its own operations by 2030

To deliver this, analysis was conducted to identify and forecast the uptake of EVs and required EVCPs in Devon and inform DCC's approach to enabling EV uptake.

Figure 2 Devon Electric Vehicle Survey summary infographic (2021)



Sources
Devon EV Survey (2021), Devon Joint Local Transport Plan (2011-2026), https://devonclimateemergency.org.uk/devon-carbon-plan/

Introduction
Definition of key terms

Table 1 Definition of key terms

Abbreviation	Definition
AC	**Alternating Current** - an electric current which periodically reverses direction and changes its magnitude continuously with time.
DNO	**Distribution Network Operator** - owns and operates the infrastructure that connects properties to the electricity network.
BEV	**Battery Electric Vehicle** – fully powered by electricity and has to be plugged in to charge.
CPO	**Charge Point Operator** – a provider and operator of EVCPs.
EV	**Electric Vehicle** – any vehicle that uses electricity for propulsion including PHEVs and BEVs.
EVCP	**Electric Vehicle Charging Point** – a location where EVs can plug-in and charge.
HGV	**Heavy Goods Vehicles** – any truck weighing over 3.5 metric tonnes, generally those used to deliver large quantities of cargo.
ICE	**Internal Combustion Engine –** the traditional method of vehicle propulsion using fossil fuels and creating harmful emissions.
OZEV	**Office for Zero Emission Vehicles** – a team working to support the transition to zero emission vehicles, part of the Department for Transport.
PHEV	**Plug-in Hybrid Electric Vehicle** – a vehicle that can be plugged in and charged but also has a combustion engine.
ULEV	**Ultra Low Emission Vehicle** – any vehicle that emits less than 75g of CO^2/km from the tailpipe.

Figure 3 EV Charging Point

Section 1: Policy context

Policy context
National policy and interdependencies

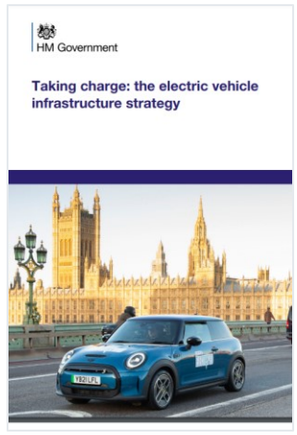
This section presents a policy review, summarising relevant national and local policy.

Nationally, there are many policies and strategies that reference the need to accelerate the uptake of EVs.

Nationally, the UK Government has committed to net zero emissions by 2050

- In 2022, the government's Taking charge: the electric vehicle infrastructure strategy outlines that transport is now the UK's largest emitting sector, and 91% of those emissions come from road transport. The document outlines that **all new petrol and diesel cars and vans will be phased out by 2030 (this has since been delayed to 2035)**
- In October 2021, the government published a Net Zero Strategy: Build Back Greener. This sets out the government's intention to end the sale of petrol and diesel vehicles, alongside the need for the UK's charging infrastructure to be reliable and accessible. The government has committed an additional £620 million to support the transition to electric vehicles and the rollout of charging infrastructure, with a particular focus on **local on-street residential charging, and targeted plug-in vehicle grants.**

Figure 4 National policies and interdependences



There are also government aspirations for the UK to be a leader in the design and production of EVs

- The 2020 Decarbonising Transport, Setting the Challenge document highlights the current challenges and steps to be taken when developing the transport decarbonisation plan to reach net zero transport emissions by 2050. The report states that in 2019, the UK was the third largest market for ULEVs in Europe and is a global leader in their development and manufacture. Future funding is addressed in the report, including government funding of £500million over five years to **support the rollout of a fast-charging network** for electric vehicles.
- The 2019 Future of Mobility Urban Strategy outlines key principles and policies that the government will implement to **further advance future mobility in the UK**. The UK mission is to be at the **forefront of the design and manufacturing of zero emission vehicles**.
- The 2018 Road to Zero strategy that sets out a path for the **UK to be a leader in the design and production of EVs** and sets out an aim for all new cars and vans to be zero emission by 2040, with almost every car being zero emission by 2050.
- The 2017 UK Plan for tackling roadside Nitrogen Dioxide Concentrations – The NO2 Plan summarises the government's plan to bring NO2 air pollution within its statutory limits in the shortest possible time. **NO2 concentrations around roads is the only statutory air quality limit that the UK is failing to meet**. The plan outlines that the government is determined to be at the forefront of vehicle innovation by **making motoring cleaner – and central to this is the government's ambition for Britain to lead the world in electric vehicle technology and use.**

Source:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1065576/taking-charge-the-electric-vehicle-infrastructure-strategy.pdf
https://www.gov.uk/government/publications/net-zero-strategyhttps://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/846593/future-of-mobility-strategy.pdf
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Policy context
Local policy and interdependencies (1/2)

Locally, Devon's EV strategy should align to established policies and priorities

- The Devon Carbon Plan describes Devon's net-zero vision. It notes:
  - T32. Develop EV Charging Strategies to deploy the right chargers in the right place.
  - T33. DCE partners to use their assets to provide publicly-accessible EV charging and shared mobility infrastructure.
  - T34. Provide electric charging infrastructure in harbours and marinas.
  - T35. DCE partners and organisations in the County to transition their fleets to Ultra Low Emission Vehicles.
  - T36. Accelerate the switch to Ultra Low Emission Vehicle taxis by placing requirements and incentives within the licensing process.
- DCC's EV Position Statement **sets out what DCC is doing accelerate the shift to electric vehicles** and what types of electric charging infrastructure it will support. It notes that the key problems that face EV uptake include the cost of the vehicles, range anxiety and lack of D charge point infrastructure, and outlines DCC's priorities.
- DCC's Transport Infrastructure Plan sets out planned investment in transport and notes that schemes that achieve an increase in electrification or improve air quality will be supported.
- The Devon and Torbay LTP set out the policies to guide the development of the transport network for the 2011-2026 period. It notes that Devon will support EVCPs "in town centres, at park and rides and in new developments" and low carbon technologies. Devon and Torbay are now drafting new LTPs that will consider zero emissions.
- The local authorities for Cornwall, Devon, Plymouth, Somerset and Torbay are working together to plan and prioritise strategic infrastructure across the peninsula. The Peninsula Transport Vision outlines the vision and goals for transport in the area, outlining the need for better connections, and affordable, zero-emission transport.
- The 2021 Devon County Council Electric Vehicle Survey surveyed EV users and non users and received over 1,600 results. The survey found that demand for EV vehicles is likely to increase, as many non-EV owners intend to buy or lease vehicles, and that more EVCPs would encourage non-drivers to buy an EV. It also found that 91% of EV drivers believe there needs to be more rapid charge points throughout Devon, and many find that public charge points are already in use upon arrival.

Locally, EVs can also more widely benefit local communities and provide social value.

- EVs can improve **air quality**, **access to transport** and support **economic growth**. In particular, a report by Cambridge Econometrics and Greenpeace has predicted that a 2030 ban on polluting cars could add **£4.2bn to the UK economy** as well as creating around **32,000 jobs**. The **potential economic opportunities identified in the report overlap with the sectors expecting growth in the region**, based on those identified by the Heart of the South West Local Enterprise Partnership (noted in the Peninsula Transport Vision). In particular, **manufacturing, clean energy, and tourism**.
- *Devonomics* report that 12% of Devon employment is related to tourism. EVCPs can enable **green tourism**, and destinations can benefit from **increased visibility** due to the increasing popularity of websites and applications such as ZapMap which show EVCP locations. For trips through Devon, EVCPs could attract people to stop-off in the area, providing an opportunity for additional economic spending during **charging dwell times**.

Figure 5 Local policies and interdependences

Sources:
- https://www.devonclimateemergency.org.uk/devon-carbon-plan/
- http://www.peninsulatransport.org.uk/wp-content/uploads/2021/07/Peninsula-TS-Vision-008.pdf
- https://www.devon.gov.uk/news/nine-in-ten-devon-residents-surveyed-plan-to-buy-an-electric-vehicle-by-2025/
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- https://www.devonomics.info/wp-content/uploads/sites/132/2018/07/Devon-districts-2016.pdf
- https://www.peninsulatransport.org.uk/wp-content/uploads/2022/02/Peninsula-TS-Vision-009-no-consultation.pdf
- Greenpeace The impact of a 2030 ICE phaseout in the UK, 2020

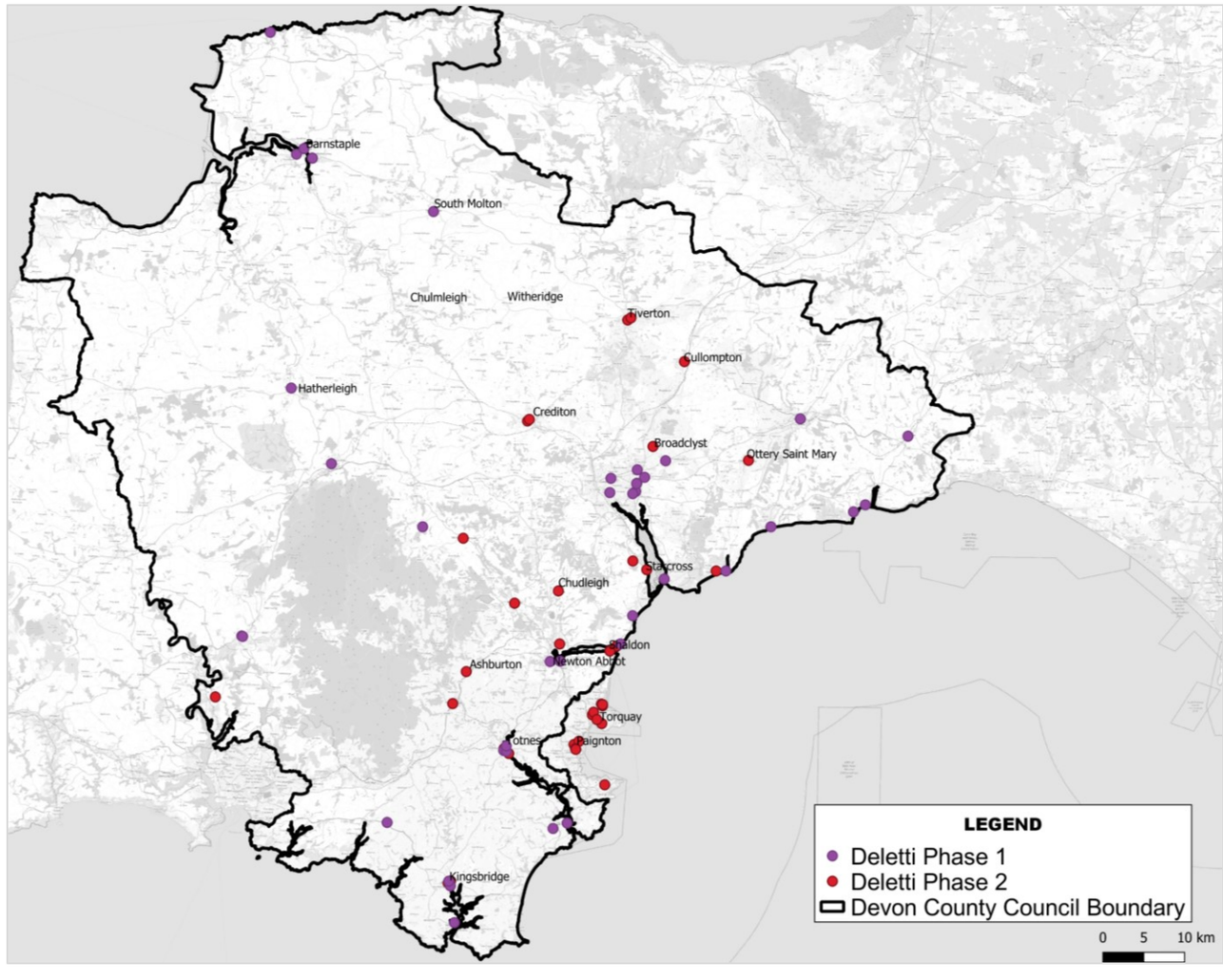
Policy context
Local policy and interdependencies (2/2)

Specific local projects also warrant consideration.

- **Rapid Charging Devon**. The Rapid Charging Devon project was an Innovate UK funded, private sector led initiative to develop and demonstrate rapid electric vehicle charging technology in Exeter and the environs. The project was led by ZPN (technology provider) and Gamma Energy (EVCP operator). Unfortunately Gamma Energy concluded at the end of the project that the ZPN charging technology was not suitable and required replacement. DCC, as highways authority, agreed that Gamma Energy could change the charging technology and are currently working with Gamma to agree a suitable technology.

- The project has provided many useful lessons for what was a innovation exercise. In light of public feedback DCC has increased the minimum distance around the EVCPs to create more space for pedestrians and are also requiring that at some locations the chargers are located on build outs (additional pavement in the parking area). Cable management is an important part of a EVCPs design and it is currently being found that 3m is the maximum length possible for the charging cable. The provision of car club EVs has been an important part of the project and DCC are requesting that as many sites as possible have a car club EV in place to increase access to low carbon transport.
- **Rural Electric Mobility Enabler** (REME) is an Innovate UK project that ran in 2021-2022, with aims to improve rural charging. Innovate UK awarded £335,000 to Bonnet, EDF, DG Cities and Devon County Council to help improve the charging of EVs in rural locations to build confidence in EVCP access, promote new local jobs and develop solutions to the issues of variable, seasonal, charging demand.
- **Western Power Distribution (WPD)** Take Charge is a project that aims to develop a new solution to supply the large power capacity required for rapid EV chargers at Motorway Service Areas (MSAs). The project is being delivered in collaboration with the motorway service operator Moto, and being trialled in Moto's Exeter service station.
- **DELETTI** is a European Regional Development Fund part-funded programme joint project between DCC and district authorities to fund the installation fast or rapid charge points in public car parks across Devon. Private providers have been procured to design, build, operate, and maintain charge points for 10 years through a concessions agreement. A further exploration of potential locations of interest with the Field Dynamics consultancy is identifying 100 of the most needed additional charging sites to help guide further rounds of deployment.

Figure 6 DELETTI Phase 1 and 2 EVCP plans



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https://www.westernpower.co.uk/news-and-events/latest-news/-take-charge-project-supports-rapid-ev-charging-on-motorways

Section 2A: Baselining and Research

Current EV vehicles and charge points

ULEV registrations in the UK

The EV market is fast-evolving, with sales of EVs and ultra-low emission vehicles (ULEVs) growing rapidly. An increasing number of ULEVs and EVs are emerging on the market, providing greater choice for consumers. Alongside this, the public and private sectors are providing significant investment to introduce infrastructure to support the electrification of transport. Government commitments and subsidies are also supporting growth in the uptake.

Figure 7 shows the number of total vehicles and ULEVs registered for the first time in the UK over time. This demonstrates that the **UK as a whole has seen growth in the number of ULEVs for the first time over recent years** as more people use them, whilst the overall number of total vehicles registered has declined recently.

Figure 8 shows the growth in ULEVs being registered for the first time in the UK. **In 2015, only 1% of newly registered vehicles were ULEV**. This figure has grown to **12% of total vehicles up to September 2021** showing a significant overall increase in uptake of ULEVs in the UK.

Figure 7 Number of ULEVs registered for the first time in the UK (thousand)

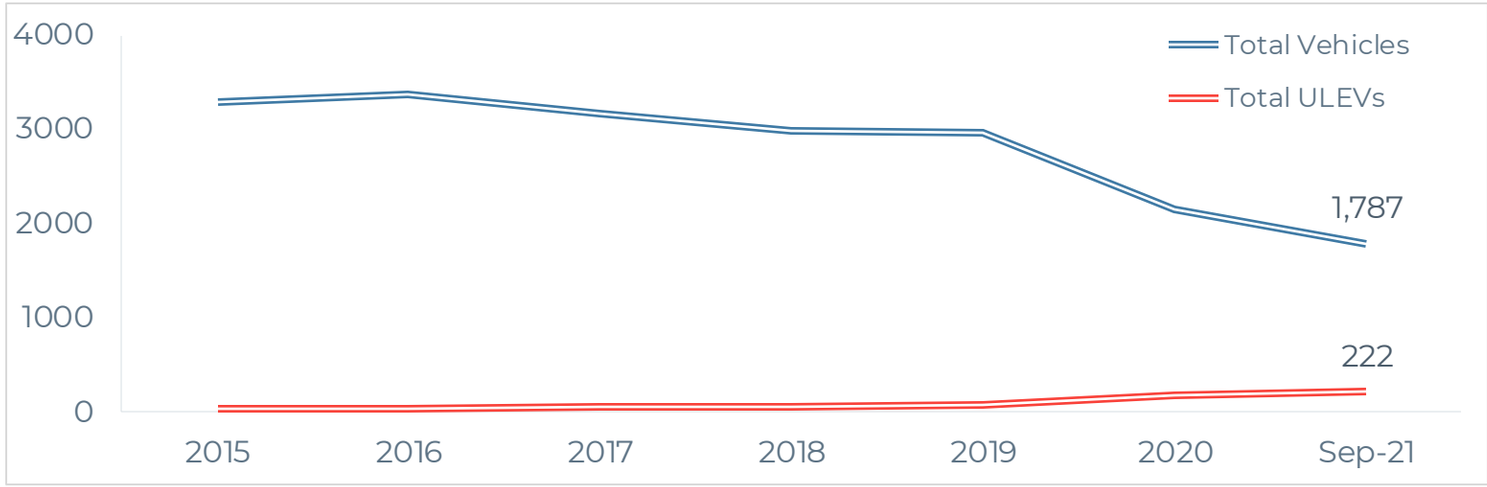
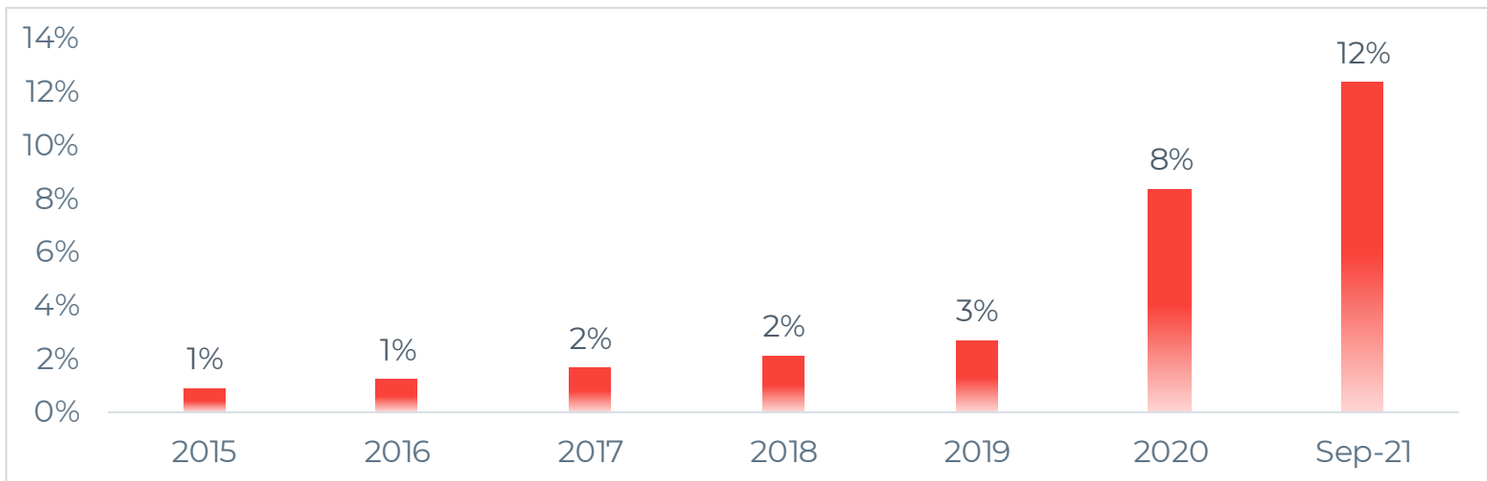


Figure 8 Percentage share of ULEVs registered in the UK (for the first time) from 2015 to September 2021.



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Baselining and Research
Current ULEV registrations - Devon

ULEV registrations in Devon

Looking specifically at Devon, shown in **Figure 9** is the number of ULEVs registered at the end of each quarter in Devon from 2016 to 2021. ULEV registrations have increased, with 6,482 vehicles registered at the end of Q3 2021. There is a **870% overall increase in the registration of ULEVs** in this time period which shows that there is an increasing popularity in Devon, due to supportive government legislation, the growth in the production of ULEV vehicles, and the increase of infrastructure.

Figure 10 shows the number of licensed EVs per 1,000 persons in Devon, compared to a sample of neighbouring counties and the UK as a whole. It shows that at present, Devon has a higher rate of EV ownership than the several neighbouring counties and the UK average. **Devon have 6 EVs registered per 1,000 people, compared to 4 per 1,000 as the UK average**.

Figure 9 ULEVs registered at the end of each quarter in Devon

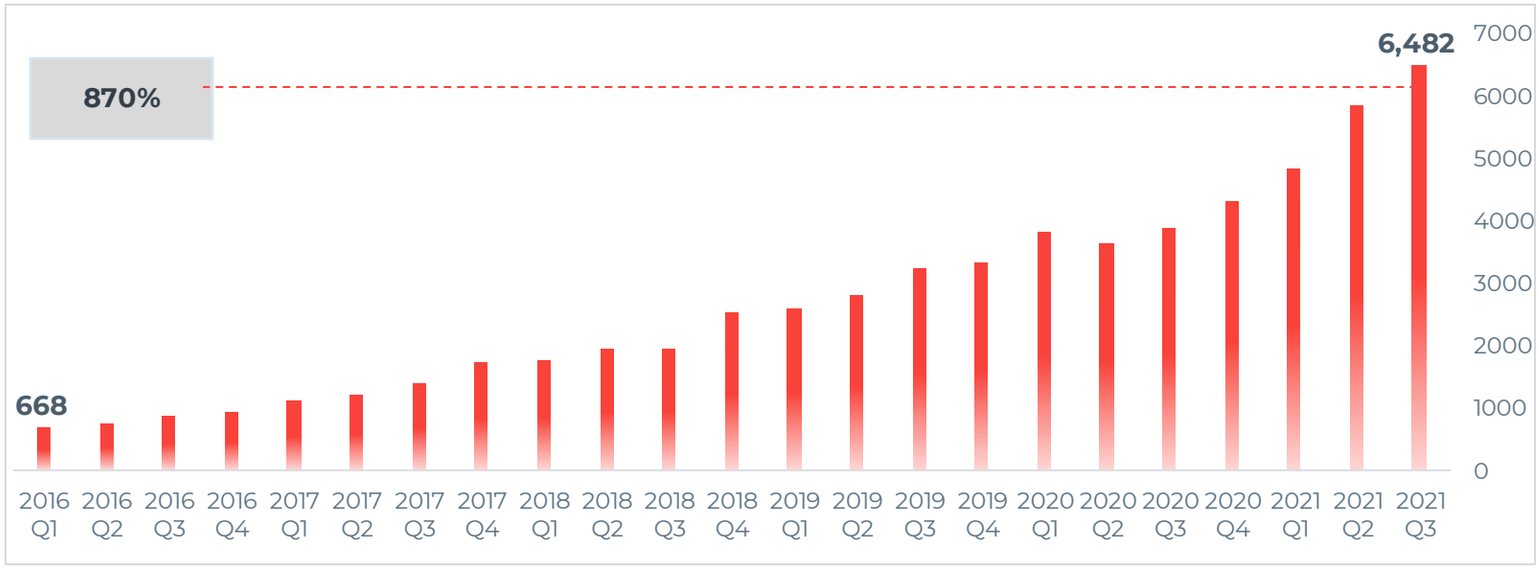
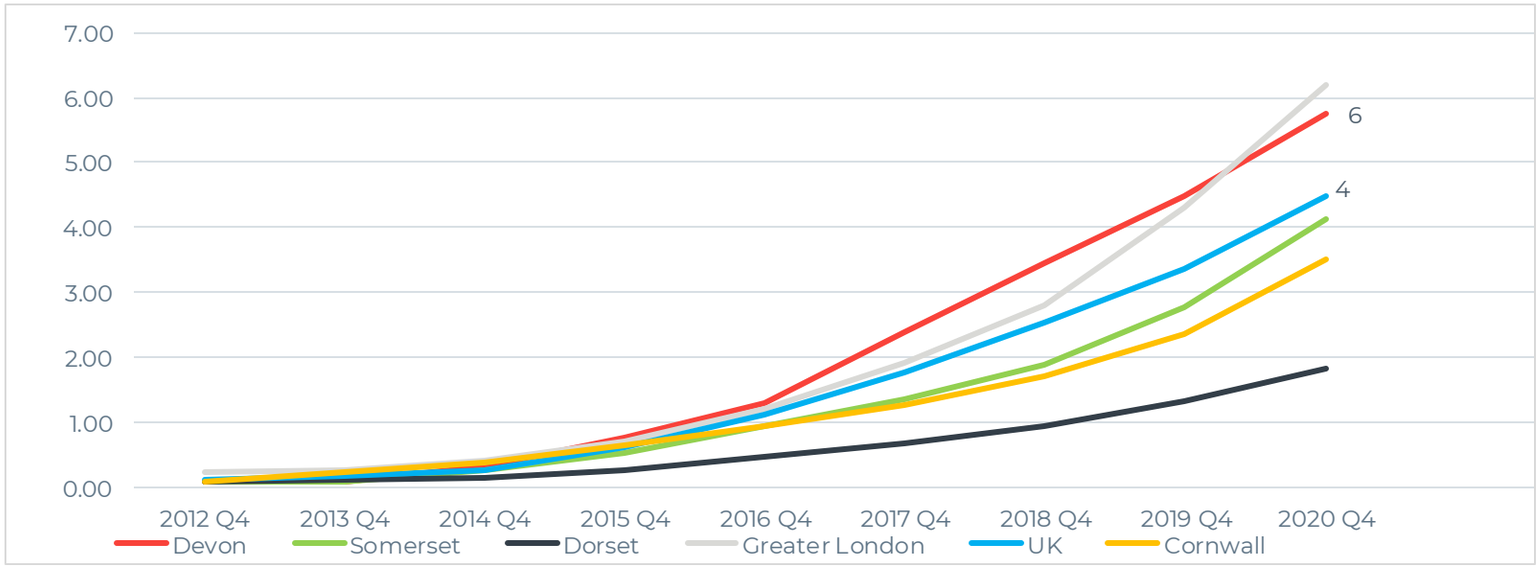


Figure 10 ULEVs licensed at end of each year per 100'000 persons



Source
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1046003/veh0134.ods
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1077500/veh0122.ods
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1077502/veh0134.ods
Note: These statistics represent the number of vehicles registered in Devon, however, it is possible that some vehicles are registered in Devon but are located elsewhere.

Baselining and Research
Current EV charge points - Devon

EVCPs in Devon

Previous pages have shown that the number of EVs in Devon is increasing and higher than comparable regions. To ensure that EV uptake can continue to grow, availability of **publicly accessible EVCPs** is key.

Figure 11 shows that there is a positive trend in the number of publicly accessible EVCPs installed across Devon, as the number of EVs have increased in popularity due to market availability and government support. There has been a total **increase of 140 publicly available EVCPs during the period of 2019 to 2021**.

Figure 12 compares the performance of Devon's installation of EVCPs to other areas . It is clear that Greater London performs the best by a large margin, and although Devon is not leading in this criterion, it is still ahead of other local areas.

Table 2 shows the number of public chargers by area of Devon in 2022. A large proportion of **publicly accessible chargers in Devon are situated in East Devon, Exeter and North Devon**. It is noted that some of this data may be out of date, due to the number of new EVCPs being rolled out across Devon's districts in 2022.

Table 2 Number of publicly accessible Vehicle Charging Devices in Devon by area, January 2022

	Rapid Chargers	Total Public Chargers (all speeds)
East Devon	17	63
Exeter	9	55
Mid Devon	13	30
North Devon	7	53
South Hams	2	34
Teignbridge	5	27
Torridge	6	24
West Devon	10	28
Total	69	314

Figure 11 No. of publicly accessible EVCPs in Devon (2019 to 2021)

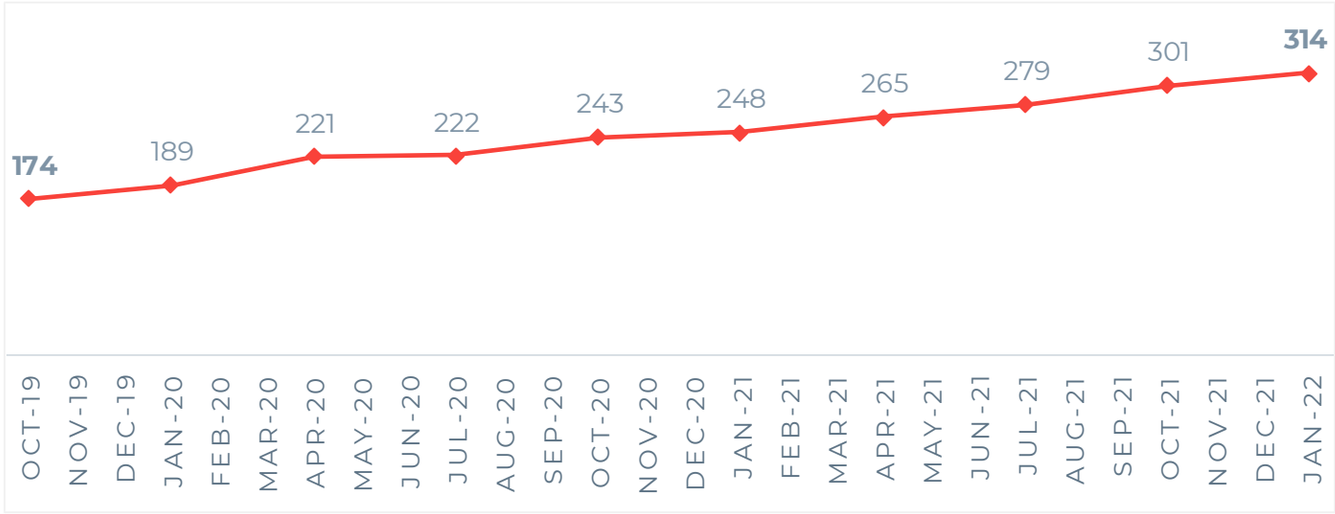
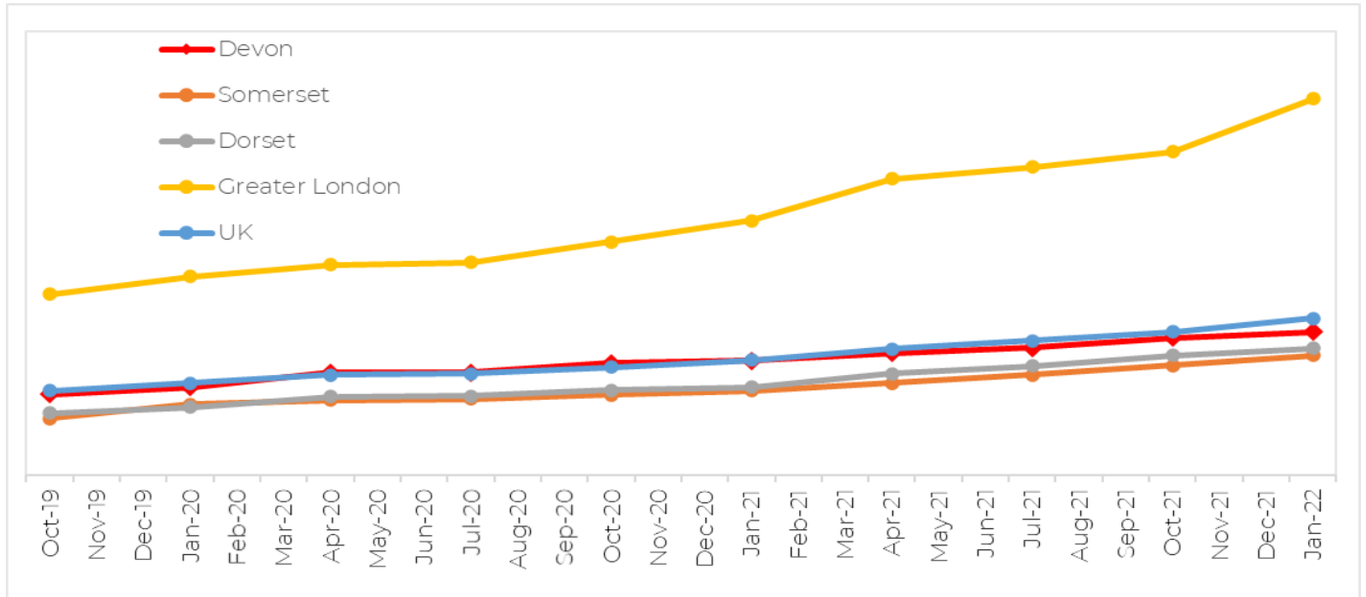


Figure 12 Publicly Accessible Electric Vehicle Charging Devices per 100,000 people



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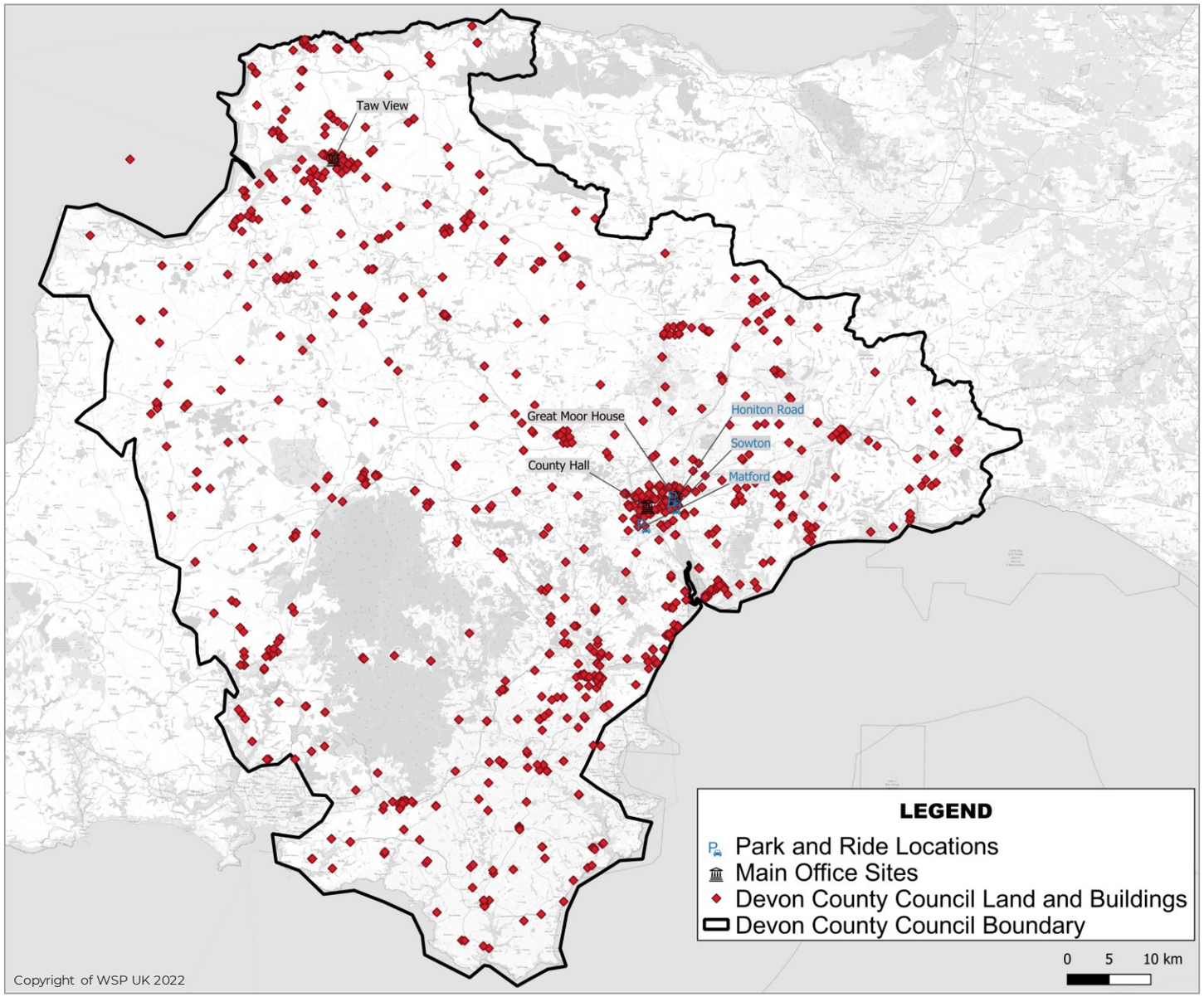
https://maps.dft.gov.uk/ev-charging-map/index.html

Council assets

To help identify potential locations for EVCPs, data was collated on the location of council-owned land. **However, this land and these assets will vary in size and suitability for EVCPs.**

Figure 13 shows DCC land and buildings, main office sites and park and ride locations. Data was provided by DCC, and supplemented through research. This demonstrates that there is a **broad geographical spread of land across the county, which could support public EVCP roll-out, but these sites would need to be reviewed further to assess EVCP viability**.

Figure 13 Distribution of council land and assets



Source
https://www.devon.gov.uk/help/contact-us/local-offices/
https://www.devon.gov.uk/factsandfigures/open-data/highways-land-buildings/location-of-devon-county-council-land-and-buildings/

Section 2B: Baselining and Research

Charge point technologies

Baselining and Research

Charge point technologies – EVCP types and charging locations (1/2)

Charge point types and locations

There are a range of EVCP technologies which are appropriate for different users and use cases. The suitability of a particular charging technology is dependent on a wide range of factors, including the use case of the individual, their vehicle type, the type of location, and the available power supply.

Table 3 summarises the different charge point types and provides information on the estimated charging duration. Charging speed varies due to a range of factors, including temperature, driving conditions, and battery condition. **Table 3** is based on the vehicle increasing from 10% charged to 80%, as in general, if a battery is charged up to around 80% the charge speed will decline.

There are four broad types of charge point sites, as summarised in **Table 4**. **Most charging currently takes place at home**, though this is expected to change in future, as more households without access to off-street parking use EVs and as more people use destination charging as vehicle ranges extend.

Field Dynamics, a net zero data analytics consultancy, also recognise 'minimum need' as a charge point location type, which includes areas where there is minimal residential or commercial activity.

The approximate share of charging demand are approximate figures and will be subject to local variation.

Table 3 Summary of the different charge point types

Alternating current (AC)

Charge point type	Charging duration (60 kWh battery)
Wall plug - AC single phase (2.3 kW)	Approx.. 30 hours
Slow - AC single phase 32A (3.7 kW)	Approx. 18 hours
Standard - AC single phase 16A (7.4 kW)	Approx. 9 hours
AC three phase 16A or 32A (11 kW)	Approx. 6 hours

Direct current (DC)

Charge point type	Charging duration (60 kWh battery)
Rapid – DC (45 kW ave.)	Approx. 56 min
Rapid – DC (65 kW ave.)	Approx. 39 min
Ultra Rapid – DC (95 kW ave.)	Approx. 27 min
Ultra Rapid – DC (150 kW ave.)	Approx. 25 min

Table 4 Summary of the different charge point locations

Location type	Charging location details	Approx. Share of Charging Demand
Home-based Charging (off-street)	Home based charging includes drive-ways, garages and off-street residents' parking. The vast majority of charging is currently home based, as this can be the cheapest and most convenient option.	75%
Workplace Charging	Workplace charging is a convenient option for employees, and well suited to the long dwell times characteristic of workplace parking, as well as the availability of private parking. Increasingly fleet vehicles are switching to EVs, which are often charged at the workplace.	15%
Destination Charging	Destination charging sites are publicly accessible sites where the driver has chosen to go to a site for other purposes, i.e. somewhere they would already have parked, such as a supermarket, railway stations, retail, leisure, hotels etc. On-street parking can also be considered as publicly accessible destination, or more accurately as origin charging. Using the definitions identified by Field Dynamics, this includes visitor sites, commercial locations and areas of public need (areas where the properties are predominantly residential and predominantly do not have access to off-street parking and charging).	6%
Intermediate Charging	Intermediate charging describes locations such as public charge points at motorway service stations and petrol stations. Typically used for longer journeys, or where a quick turnaround charge is required.	5%

Sources:
Field Dynamics (2022)

Baselining and Research

Charge point technologies – EVCP types and charging locations (2/2)

Charge point types by land use

The key determinants of the charging requirements for any given site are often the **typical dwell times** of the vehicle at the site, and the requirements of the driver for their use of the vehicle.

In most cases, vehicles are parked for long durations at homes or workplaces, therefore vehicles can be charged at lower power over a longer period, which is beneficial as it lessens the peak loading requirements and enables more charge points to be installed.

Table 5 shows the type of use cases for charging, across different land uses, and considering typical dwell times and charging requirements.

Table 5 Users and charge point types

Land use Type	Typical Use Case	Typical Dwell Time	Typical Charging Requirements	Typical EVCP Provision
Residential	Resident or employee (fleet vehicles)	Long dwell time (over 3 hrs)	Slower speeds – typically overnight charging	Slow / Standard Charger
Offices/ Industrial (with staff car parks)	Employee	Long dwell time (over 3 hrs)	Slower speeds – typically occasional daytime charging	Slow / Standard Charger
Offices/ Industrial	Visitor	Medium dwell time (1-3 hrs)	Moderate speeds – typically occasional daytime charging	Standard/ Fast Charger
Offices/ Industrial	Fleet	Long dwell time (over 3 hrs)	Moderate speeds – daytime or overnight charging	Slow / Standard Charger
Offices/ Industrial	Fleet	Short dwell time (less than hour)	Higher speeds – reflecting short dwell time	Rapid Charger
Shops/ Retail/ Leisure/ Hotels (with customer/ visitor/ public parking)	Customer	Long dwell time (over 3 hours)	Slower speed for overnight charging (e.g. hotels)	Slow / Standard Charger
Shops/ Retail/ Leisure/ Hotels	Customer	Medium dwell time (1-3 hrs)	Moderate speeds – typically occasional daytime charging	Standard/ Fast Charger
Shops/ Retail/ Leisure/ Hotels	Customer	Short dwell time (less than hour)	Higher speeds – reflecting short dwell time	Rapid Charger
Shops/ Retail/ Leisure/ Hotels	Employee	Long dwell time (over 3 hrs)	Slower speeds – typically occasional daytime charging	Slow / Standard Charger
Shops/ Retail/ Leisure/ Hotels	Fleet	Medium dwell time (1-3 hrs)	Moderate speeds –daytime or overnight charging	Standard/ Fast Charger
Shops/ Retail/ Leisure/ Hotels	Fleet	Short dwell time (less than hour)	Higher speeds – reflecting short dwell time	Rapid Charger

Baselining and Research
Charge point technologies – design principles

Residents and visitors experience

Devon has a diverse community, with a wide range of residents and visitors. **It is essential that the design and delivery process for EVCPs puts people first.**

The approach to rolling out EVCPs should include:

- **Segmenting those living in or visiting Devon to understand their needs, preferences and behaviours.** This should include EV users and non-users, such as visitors, residents, pavement users, businesses, those seeking parking, and considering protected characteristics. This approach is currently under development as part of the **Peninsula Transport and Western Gateway Rural Mobility Strategy** and DCC will need to consider this for EVCP roll-out.

- **Considering the diverse range of needs related to the type of place**. This could include heritage communities, deep rural areas and tourist destinations.

In addition, design principles should be considered for EVCPs:

- **Convenience** – understanding user needs regarding charging and access to amenities.
- **Deliverability** – the site must be deliverable at an acceptable cost and timescales - power connection is a key determinant to this.
- **Safety** – designs should consider vehicular access arrangements, potential trip hazards, proximity to junctions/ crossings etc.
- **Scalability** - ensure that more EVCPs can be added to a existing network at a later date. If the initial units that are installed are dumb chargers (not able to optimise electricity supply) this limits further installation as the power supply may need upgrading.
- **Interoperability** – ensure EVCPs are easily accessible regardless of the CPO.
- **Future Proofing** – DCC stakeholders have noted that standardisation and upgradability are key considerations, to account for operator / hardware changes.
    - 'Passive charging provision' ensures that a parking bay is fitted with technical cabling and the reserved power supply, to enable EVCPs to be installed cheaply and quickly at later date.
    - The same principle applies to readying a site for higher power charging in the future, should the units need to be upgraded, making sure the charge points are repairable and upgradable.

Technical standards

The Office for Low Emission Vehicles (OLEV) have prepared minimum technical specifications for a range of charge points where grant funding is being sought. Further best practice guidance on charge point technical specifications and installations is provided by:

- **BEAMA Guide to Electric Vehicle Infrastructure** provides a comprehensive list of the relevant published standards and regulations in terms of wiring, plugs, sockets, outlets, connectors and communications.
- **The UK Electric Vehicle Supply Equipment Association (UK-EVSE) Procurement Guide** provides detailed references.
- **The IET Code of Practice for Electric Vehicle Charging Equipment Installation**, 4th Edition sets out the considerations needed prior to installation, and the necessary physical and electrical installation requirements.

Figure 14 Electric vehicle charge point

Baselining and Research
Charge point technologies – accessibility (1/3)

Accessibility

The **Equality Act 2010** states that goods and services are obliged to make reasonable adjustments to their facilities to improve accessibility for all. In line with DCC policies, the EV charging approach used must be inclusive. Whilst accessibility guidance is developing, **it is important for DCC to take a forward-looking stance to ensure EVCPs are accessible.**

At present, **there is limited official best practice or regulation that sets out EVCP accessibility requirements for Local Authorities or operators.**

- In December 2021, the DfT launched '**Inclusive Mobility' – A guide to Best Practice on Access to Pedestrian and Transport Infrastructure.**
- In March 2022, British Standards (BSI) launched a public consultation into accessible EVCP design, sponsored by the disability charity Motability. The **PAS 1899 standards aim to provide a universal specification for the minimum level of accessibility for all electric vehicle charge points in the UK.**
- **Transport for London** also have published accessibility guidance for EVCP design.

It is clear that **better EVCP design is required in order to make EV ownership accessible to all**.

Source:
https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1044542/inclusive-mobility-a-guide-to-best-practice-on-access-to-pedestrian-and-transport-infrastructure.pdf
https://lruc.content.tfl.gov.uk/london-electric-vehicle-charge-point-installation-guidance-december-2019.pdf
https://standardsdevelopment.bsigroup.com/projects/2021-01846#/section

Inclusive design should be applied to the deployment of EV charging infrastructure:

- **Bay markings, signage and enforcement**: Bays should be marked appropriately along with accompanying signage to make road users aware if a bay is available for general use or reserved for specific users (e.g. those with disabilities). Appropriate enforcement should also be applied to discourage misuse. Any design including signing and lining will be subject to the advertisement and approval of the necessary Traffic Regulation Order.
- **Parking bay size and layout**: Bay length and width sufficient to allow manoeuvrability around vehicle, including buffer zone between vehicle and carriageway.
- **Footway:** Footway width sufficient to accommodate a charge point and not intrude on comfort of footway users.
- **Charge point interface:** The charge point should be easy to operate for all users, such as those who face dexterity issues. Instructions on operating the charge point should also be easy to understand; in the instance where a user struggles to understand, a 'help' or 'call for assistance' option may be provided.
- **Safety and Security:** Additional measures such as providing suitable lighting and CCTV will improve comfort of charge point users where natural/ active surveillance is limited during dark hours. This improves the setting for all users, especially those who are alone.

Key points to note from the DfT's Inclusive Mobility guidance:

- **EVCPs should be positioned to leave at least the minimum width recommended for a pedestrian footway**. Footways and footpaths should be made as wide as possible, ideally with a width of >2,000mm, or if there is an obstacle, such as an EVCP, the width should be at least 1,000mm (using DfT guidance).
- **Where a footway is adjacent to a road used by motor vehicles, any post placed on the road-side of the footway should be at least 450mm from the edge of the road**. This distance should be at least 600mm where there is a severe camber or crossfall. If there is more than one post, they should be at least 1,000mm apart.
- Street furniture should be **consistently located** (as close as possible to the same position in sites across the county) and **colour contrasted** with its environment to ensure it can be seen by people with visual impairments.

Baselining and Research
Charge point technologies – accessibility (2/3)

Accessibility

Key points to note from the PAS 1899 Draft for Public Consultation:

EVCP cable design

- **Cable weight, stiffness and bulk should be minimised**, considering a **cable management system** and a proportion of the charging cable length remaining supported if the full length of the cable is not required to charge the vehicle.
- For all higher-powered public EVCPs (those with a power rating of >50kW and delivering DC charging), where the charging cables are heavier, a **cable management system** should be used.
- For all higher-powered public EVCPs requiring liquid-cooled cables (i.e. most EVCPs with a power rating in excess of 200kW), the cable management system shall comprise a **pull-back mechanism** to ensure the cable is supported.
- **Cable lengths should be sufficient to accommodate a range of vehicle parking positions, vehicle sizes and vehicle socket locations** whilst ensuring the cable does not trail on the ground during the charging process.
- The EVCP cable and connector shall be of a **suitable colour and contrast.**

EVCP connector

- The EVCP **connector grip / handle shall be of a suitable material and ergonomic** design to be usable by people including disabled people with strength or dexterity issues.
- **The diameter of a portion of a EVCP connector grip or handle shall be between 19mm and 43mm.**
- EVCP connectors or sockets shall be clearly and unambiguously **labelled** to indicate the type of connector.

Charge point interface:

- The content and composition of any screen or visual interface on a public EVCP, including **font size, colours, contrast and layout**, shall be designed so that the content is accessible to a broad range of users
- The content and text on a screen or visual interface on a public EVCP shall be **easily readable for those with vision impairments and colour blindness**; consideration shall also be given to the needs of those for whom English or Welsh is not their first **language, including British Sign Language users.**
- The instructions and information provided on any screen or visual interface on a EVCP shall be produced in easily understandable and **plain English** or Welsh, and shall consider the **use of simple symbols** to convey information.

Height and reach

- **The height of the EVCP components should be suitable for all users**, including wheelchair users, mobility aids, those of short stature and those with dexterity impairments.
- The EVCP shall be positioned and oriented such that the components can be **easily viewed, reached and operated from a seated or fully standing position**, with sufficient space around to enable access to the components for a range of users, including a wheelchair user or a user of another mobility aid, **with a minimum space of 1,200mm in front of the EVCP components, and ideally 1,800mm in front of the EVCP components**
- Where public EVCPs are placed and installed at footway level where (1) EVCP operation is from carriageway level and (2) all EVCP components are facing towards the edge of the kerb, all components shall be placed at a **reach distance not exceeding 300mm from the edge of the kerb, and preferably within a maximum of 200mm from the edge of the kerb, to enable side reach as a minimum**.

Table 6 BSI draft height range requirements for EVCP components

Chargepoint component	Minimum height	Maximum height
Chargepoint socket	750 mm	1 000 mm
Charging cable/chargepoint connector	800 mm	1 000 mm
Cable management system	800 mm	1 000 mm
Screen/visual interface	Top of screen/visual interface at 1 100 mm	Top of screen/visual interface at 1 300 mm
	Interactive aspects (e.g. buttons, touchscreen) at 800 mm	Interactive aspects (e.g. buttons, touchscreen) at 1 000 mm
Payment terminal	800 mm	1 000 mm

Source: https://standardsdevelopment.bsigroup.com/projects/2021-01846#/section

Baselining and Research
Charge point technologies – accessibility (3/3)

Accessibility

To illustrate potential layouts of accessible EVCP designs, several examples have been provided; **Figure 15** demonstrates that the tilt of a screen or visual interface must be visible for those seated or standing, **Figure 16** and **Figure 17** show example arrangements / layouts that are documented within Transport for London's Electric Vehicle Charge Point Installation Guidance (December 2019)

Figure 15 BSI - Tilt angle of screen / visual interface

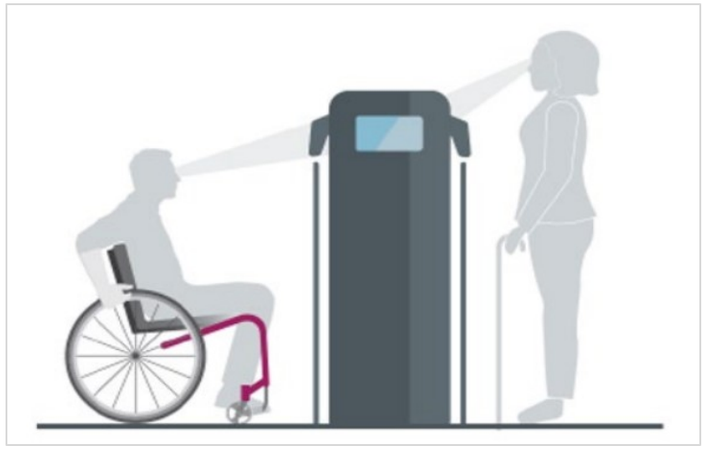
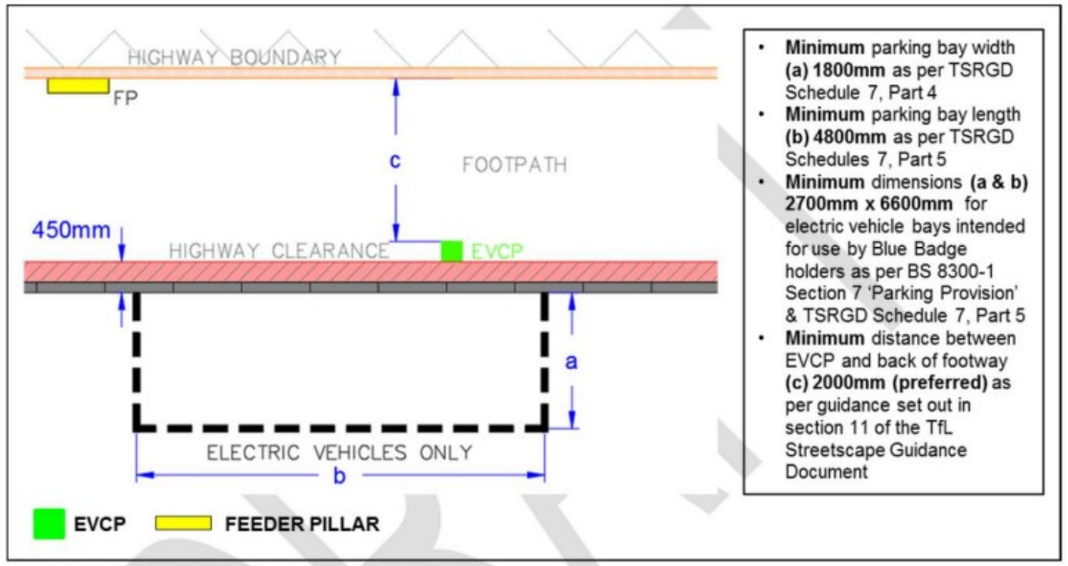
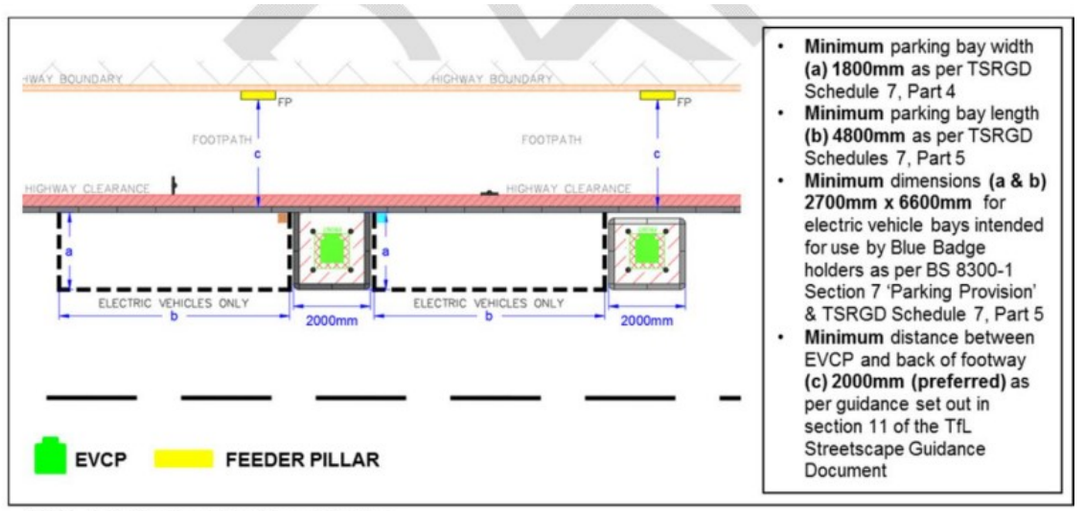


Figure 16 Transport for London – Electric vehicle charge point installation on the footway



TSRGD – Traffic Signs Regulations & General Directions
BS 8300-1 – Design of an Accessible and Inclusive Built Environment, Part 1: External Environment – Code of Practice

Figure 17 Transport for London – Rapid electric vehicle charge point installation in the carriageway



TSRGD – Traffic Signs Regulations & General Directions
BS 8300-1 – Design of an Accessible and Inclusive Built Environment, Part 1: External Environment – Code of Practice

Source:
https://standardsdevelopment.bsigroup.com/projects/2021-01846#/section
https://lruc.content.tfl.gov.uk/london-electric-vehicle-charge-point-installation-guidance-december-2019.pdf

Baselining and Research
Trailing cables

Trailing cables

A large proportion of charging is expected to be home-based, however, **not all visitors or residents in Devon will have access to off-street parking**.

For those without off-street parking, some residents have already begun to charge vehicles by **'trailing cables' over the footway, from their own domestic charge point or wall socket to their vehicle**. There are **safety and legal issues** with this, including whose responsibility it would be if a member of the public was to trip. DCC's EV position paper makes it clear that no trailing cables will be allowed.

According to the **Highways Act 1980**, running an electric cable across the highway to charge a vehicle from home or businesses will find residents or businesses liable for injuries or damage to property.

"A person who for any purpose places any rope, wire or other apparatus across a highway in such a manner as to be likely to cause danger to persons using the highway is, unless he proves that he had taken all necessary means to give adequate warning of the danger, guilty of an offence and liable to a fine not exceeding [Level 3 on the standard scale]."

It is necessary to find a solution to enable charging whilst minimising risk. Two options are now frequently being considered to enable safe charging (**Figure 18**)

- **Gullies:** A cable installed into the footway
- **Cable Protectors:** A way to reduce the trip hazard, by covering the cable above the footway

Several councils are taking a proactive approach to this. For example, Hampshire County Council have published guidance, and Norfolk County Council now allow residents to apply for permission to place an EV charging cable across a public footway.

Through 'OxGul-e', **Oxford City Council have also piloted gullies**, which found that they offer value for money and positive utilisation. The pilot recognised that consideration needs to be given to where gullies are not feasible (e.g. heritage areas), shared use, and decommissioning.

Work by WSP found that councils should adopt a **pragmatic and precautionary approach**, **permitting residents to charge their vehicle with appropriate safety measures in place**. This also found that covers and gullies are **more acceptable in low footfall and low parking areas**.

This approach would **require testing prior to any Devon-wide roll out, and clear policies and guidance on safe and considerate deployment** of cables across the footway, including where these solutions are / aren't acceptable. Any guidance must be cognisant of pavement users, their range of needs and **legal advice** to understand potential liability risks.

Figure 18 Example of a gully & cable protector

Sources
https://lruc.content.tfl.gov.uk/london-electric-vehicle-charge-point-installation-guidance-december-2019.pdf
Highways Act 1980, Section 162, Penalty for placing rope, etc. across highway. https://www.hants.gov.uk/transport/electric-vehicles/ev-charging-guidance
https://energysavingtrust.org.uk/case-study/oxgul-e/

Baselining and Research
Grid constraints (1/2)

Electricity network

In the UK, **Distribution Network Operators (DNOs) are responsible for the distribution of electricity from the transmission network to end users**. Electricity is distributed at different voltages, which are stepped up and down using transformers at substations.

Primary substations generally have a voltage of 11kV or 6.6kV and secondary substations, have a lower voltage of 400V and distribute electricity to domestic properties.

Individual EVCPs, such as single domestic or fast chargers, have a demand of 3kW (single phase) to 22kW (three-phase) so these will connect to the low voltage network through secondary substations. **If a cluster of individual EVCPs is provided in the same street or estate, there is a risk that the energy demand may overload the local secondary substation**.

Large groups of EVCPs or rapid chargers (such as in EV service stations or supermarkets with a large amount of EVCPs) will likely connect to primary substations.

Whilst grid constraints can pose a significant barrier to delivering EV infrastructure, steps can be taken to overcome this. The first step is to ensure the available energy is used effectively. **Smart charging and dynamic load management** are fundamental in this regard at the local site level.

However, where demand still exceeds supply capacity, options need to be considered to increase the energy supply available to the chargers. A range of measures are available for overcoming grid constraints, including upgrades, load management and flexible connections, through to on-site generation.

Some Local Authorities and Local Authority Collaborative Bodies are beginning to move towards influencing and improving electricity network improvements.

Grid capacity in Devon

Western Power Distribution (WPD) is the local Distribution Network Operator (DNO) in Devon.

Engagement with WPD indicates that there is a **lack of grid and substation capacity in many Devon communities**. These constraints will mean further investment from WPD will be needed to unlock more capacity to deliver EV charging plugs and larger sites.

Capacity considerations noted by WPD include:

- **Countryside mains connections** which do not allow for the expected demand from public and private EV charging and will need to be upgraded as needed
- Similar limitations in neighbourhoods where mains were installed in the post-WW2 period, necessitating **works to upgrade cables**
- **Additional substations required in urban areas to cope with additional EV demand, including the potential need to purchase land** to accommodate new substations in crowded neighbourhoods
- **If lamppost plugs are used for on-street charging, capacity may be an issue.** This will need to be addressed by an upgrade to local grid capacity or less costly alternative charging solutions

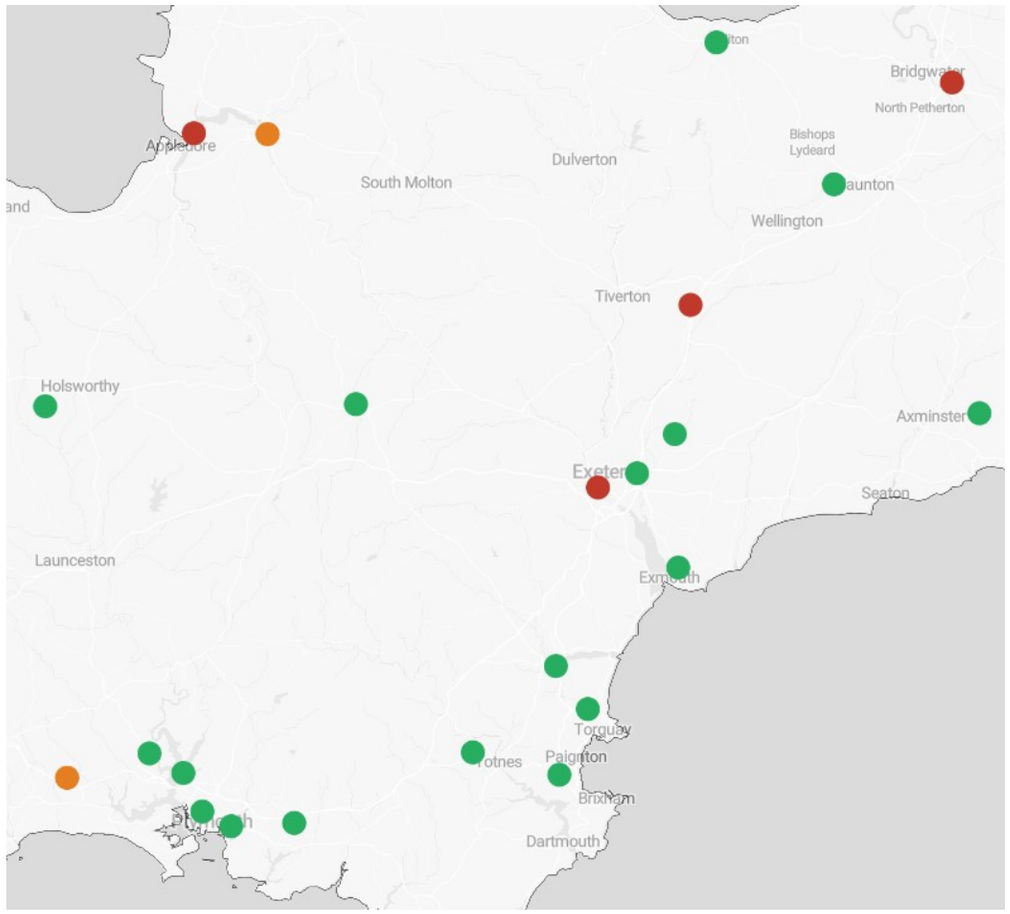
Source: *https://liverpoollep.org/wp-content/uploads/2017/03/Electricity-Networks-and-Local-Authorities-Report-Final.pdf*

Baselining and Research
Grid constraints (2/2)

Grid capacity in Devon (cont.)

Figures 19 and 20 show the distribution and capacity of substations, and therefore the potential capacity for EVCP roll-out. However, these maps do not show the entire picture in terms of constraints.

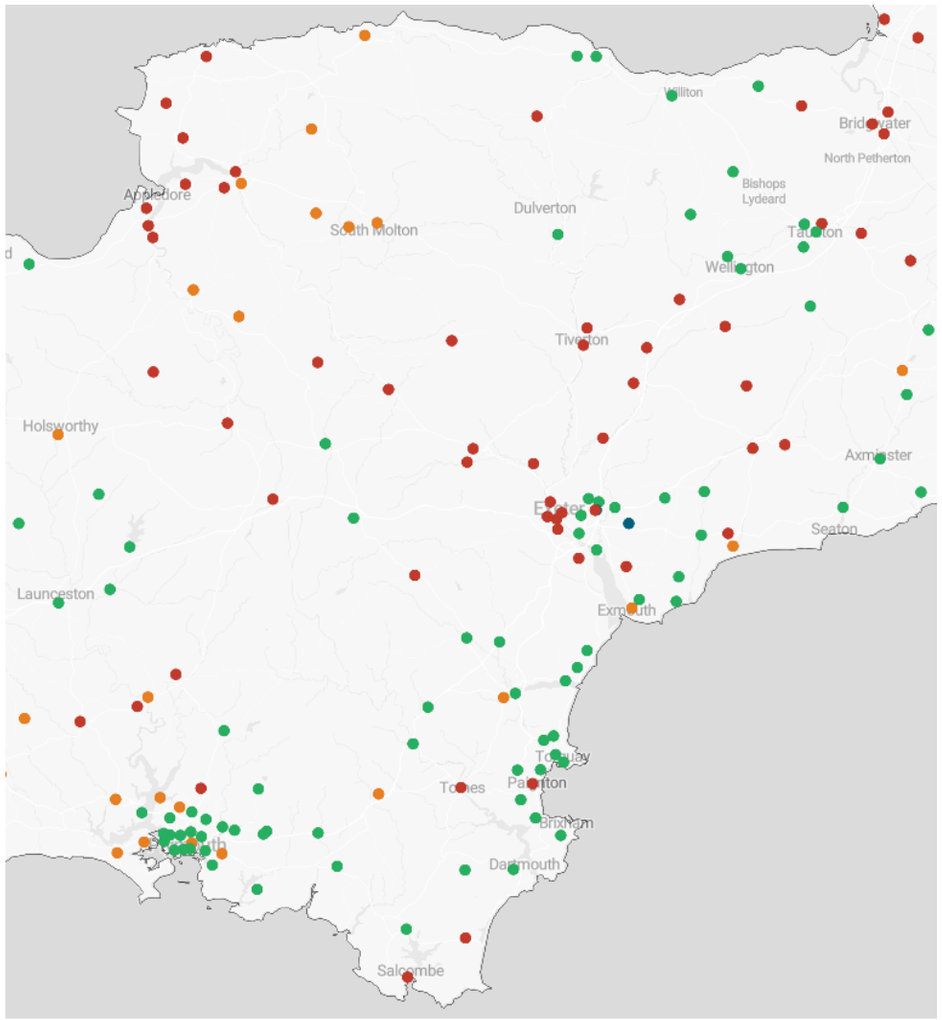
Figure 19 Bulk supply substations capacity for demand in Devon (WPD, 06/2022)



Map key

Bulk Supply Point (BSP)	Intermediate substation generally where 132kV is transformed down to 33kV
High (Green)	15% total site capacity still available
Medium (Amber)	5% to 15% total site capacity still available
Low (Red)	Less than 5% total site capacity available

Figure 20 Primary supply substations capacity for demand in Devon (WPD, 06/2022)



Map key

Primary	Intermediate substation generally where 33kV is transformed down to 11kV
High (Green)	20% total site capacity still available
Medium (Amber)	10% to 20% total site capacity still available
Low (Red)	Less than 10% total site capacity available

Source: *https://www.westernpower.co.uk/our-network/network-capacity-map-application*

Indicative capital and operating costs

The costs of installing charge points can be split into two broad categories, **the costs of the charge point unit, delivery, ground works and installation, and separately, the grid connection costs**.

There can be **significant variability in the grid connection costs, subject to the local conditions, the distance of the connection and whether any upgrades are required**. Given the previous pages outline potential constraints across Devon, costs could escalate. In some cases, this may only entail the DNO upgrading service fuses, but in other cases it may entail reinforcing DNO hardware (local transformers, substations etc) at significant cost and delay. In these cases, it is often advisable to consider an alternative site. In some locations there may be an existing energy supply, with adequate power capacity which is within reasonable distance of the proposed charge point. In this case, a new DNO connection is not required.

Due to the large power requirements, rapid chargers are most likely to require significant grid upgrades. **Smart charging, load balancing, on-site generation and renewables and battery storage can all help to reduce grid connection costs**.

Table 7 Indicative capital and operating cost ranges for EVCPs by location type

Cost category	Charge/Site Type	Standard/ Fast (Off-Street)		Standard/ Fast (On-Street)		Rapid		Ultra Rapid	
	Cost Range:	Low	High	Low	High	Low	High	Low	High
Capital costs	Charging Unit and Installation	£750	£5,000	£1,700	£5,000	£15,000	£30,000	£56,000	£88,000
Capital costs	Grid Connection	£0	£3,000+	£2,500	£10,000+	£3,000	£60,000	£10,000	£75,000
Operating costs (annual)	Annual Subscription / Operating Cost	£50	£200	£50	£200	£200	£1,200	£200	£800
Operating costs (annual)	Annual Service Package and Maintenance	£200	£450	£200	£500	£800	£5,000	£1,100	£5,300

Table 8 Indicative DNO connection cost ranges by charge point deployment size

Charge Point Deployment Size	Power Requirement	DNO Connection Cost (Approximate)
Small ▪ 1-3 Fasts, or ▪ 1 Rapid	Up to 70 kVA	£1,000-£3,000
Medium ▪ 10-50 Fasts, or ▪ 4-20 Rapids, or ▪ 1-6 Ultra-Rapids	200-1,000 kVA	£4,500-£75,000
Large ▪ 50+ Fasts, or ▪ 20+ Rapids, or ▪ 6+ Ultra Rapids	Over 1,000 kVA	£60,000-£2m

Source:
https://www.r-e-a.net/wp-content/uploads/2020/03/Updated-UK-EVSE-Procurement-Guide.pdf

Section 3A: Forecasting demand and charging requirements

Approach and EV uptake forecasts

Forecasting demand and charging requirements
Approach

Overview and approach

Having baselined the existing EV uptake and EVCP provision across Devon, **a forecast of future uptake of EVs has been completed up to 2030**.

Using the demand forecasts, **analysis has been undertaken to provide an indication of requirements for publicly accessible EVCPs**. This section of the report explains the approach to forecasting demand and EVCP requirements and presents the results.

The approach utilises WSP's ***EV:Ready* tool** to derive 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.

Figure 21 EV forecasting approach

1. Baseline the number of registered EVs and existing EVCPs across Devon; 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 across Devon, taking account of typical vehicle ownership levels
5. Forecast EVCP requirement and consider what proportion the private sector is likely to deliver
6. Gap analysis to identify areas where gaps in provision of EVCPs might arise and so what the public sector may need to deliver

Forecasting demand and charging requirements

EV uptake forecasts - Devon propensity towards EVs

Devon propensity towards EVs

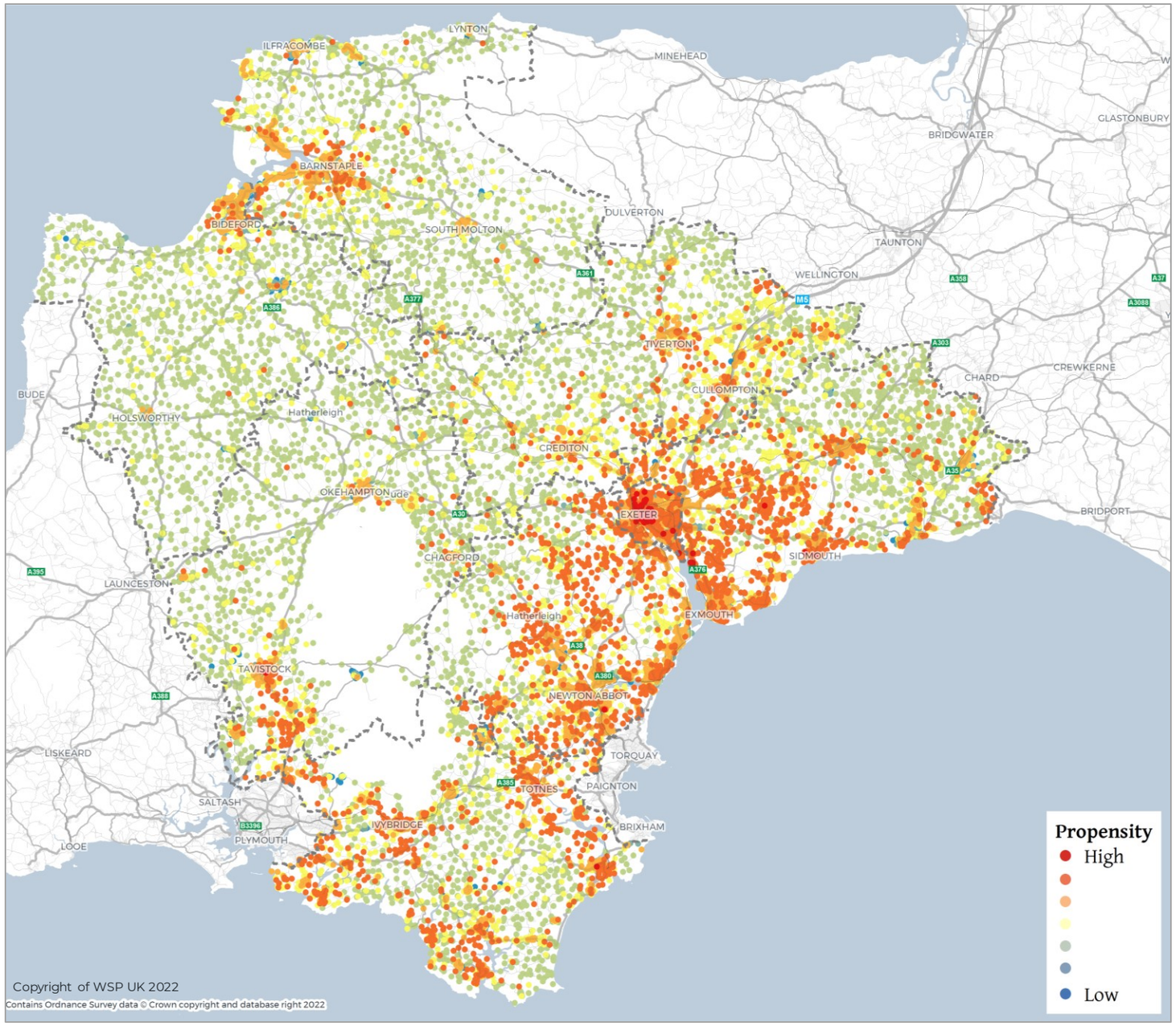
The ***EV:Ready*** **forecasts account for a number of local factors in determining localised variations in EV uptake**, these include:

- **Propensity to purchase or lease an EV** – based on socio demographics / consumer attitudes
- **Car ownership**
- **Reliance on on-street parking**

Experian Mosaic categorises the entire UK population into one of 66 consumer groups, based on factors including demographics and preferences.

Each of the consumer groups has been scored for their propensity to switch to an EV based on 10 different indices, which provide a statistical measure of variation across a representative group of individual data points. **In Devon the average propensity towards EV is 9% lower than the UK average**.

Figure 22 Propensity of residents to switch to EV



Forecasting demand and charging requirements

EV uptake forecasts - Vehicle ownership levels

Vehicle ownership levels

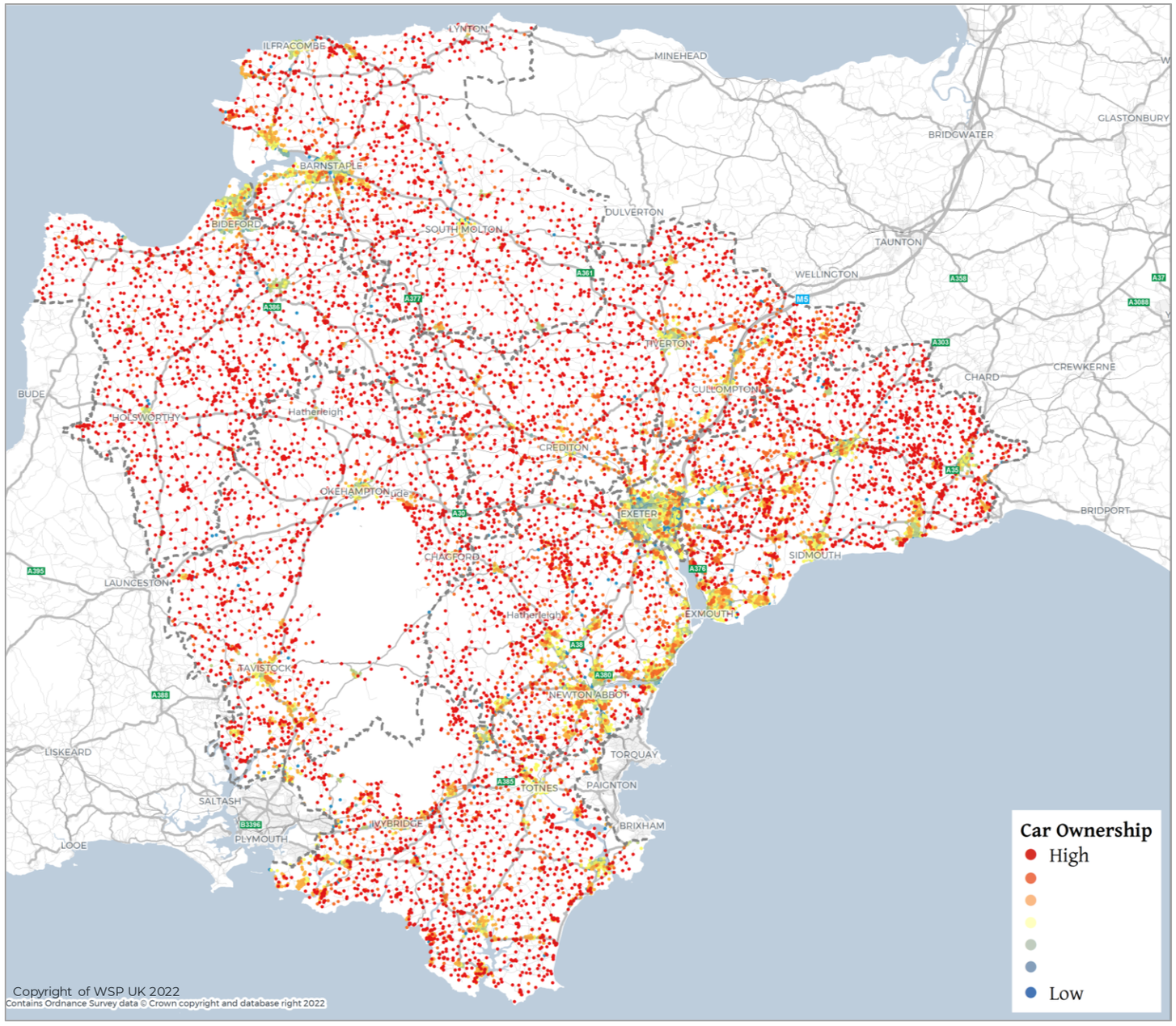
Figure 23 presents average vehicle ownership levels by household at a postcode level, based on Office for National Statistics (ONS) data.

Whilst some local populations may have a high propensity to switch to an EV in principle, they would not be expected to purchase an EV if they are not already a vehicle owner. **Propensity to switch to EV must therefore be considered in conjunction with the car ownership** levels of a given area.

Figure 23 shows that car ownership is high across much of Devon, and as would be expected, the areas of lower car ownership are concentrated around Exeter and in the other urban centres such as Barnstaple, Newton Abbott and Bideford, where there is greater access to public transport and active travel. Parking supply is also more constrained.

Conversely, the more **rural areas across the county are much more car dependent**, which is reflected in their higher levels of vehicle ownership. Overall, the high level of car-ownership in most of Devon shows a high level of car-dependency. Blank areas on the map, such as in Dartmoor, indicate a lack of data due to low population levels.

Figure 23 Car ownership levels



Forecasting demand and charging requirements

EV uptake forecasts - Off-street parking availability

Off-street parking availability

To aid in identifying demand for EVCPs, analysis was undertaken to approximate the proportion of households without access to off-street parking.

Figure 24 shows off-street parking availability, with analysis conducted by Field Dynamics and **Figure 25** shows this based on WSP analysis. Field Dynamics are a net zero data analytics consultancy and have analysed the Devon area.

WSP's analysis is based on typical property types within the locality, assuming that terraced dwellings and flats are more reliant on on-street parking. This calculation focusses on the proportion of households that would be reliant on on-street parking and does not account for number of vehicles per household, density or on-street parking restrictions.

Both Figure 24 and Figure 25 show that in **the denser urban areas, the availability of off-street parking decreases**. Properties that rely on on-street parking would by proxy by reliant upon on-street charging, if they were to adopt an EV.

Figure 24 Map of off-street parking availability **(Field Dynamics)**

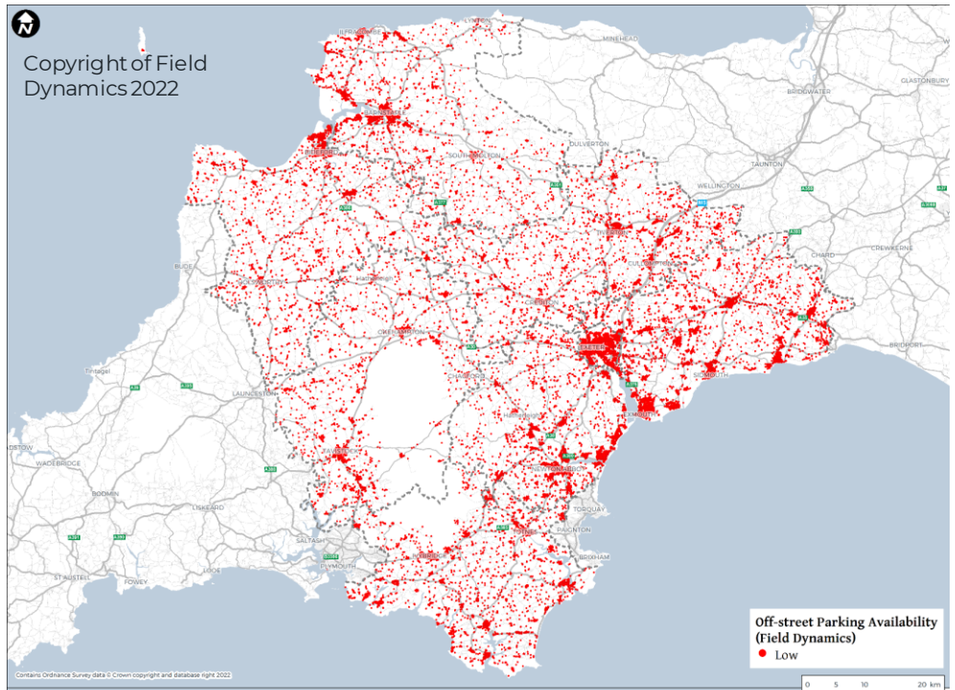
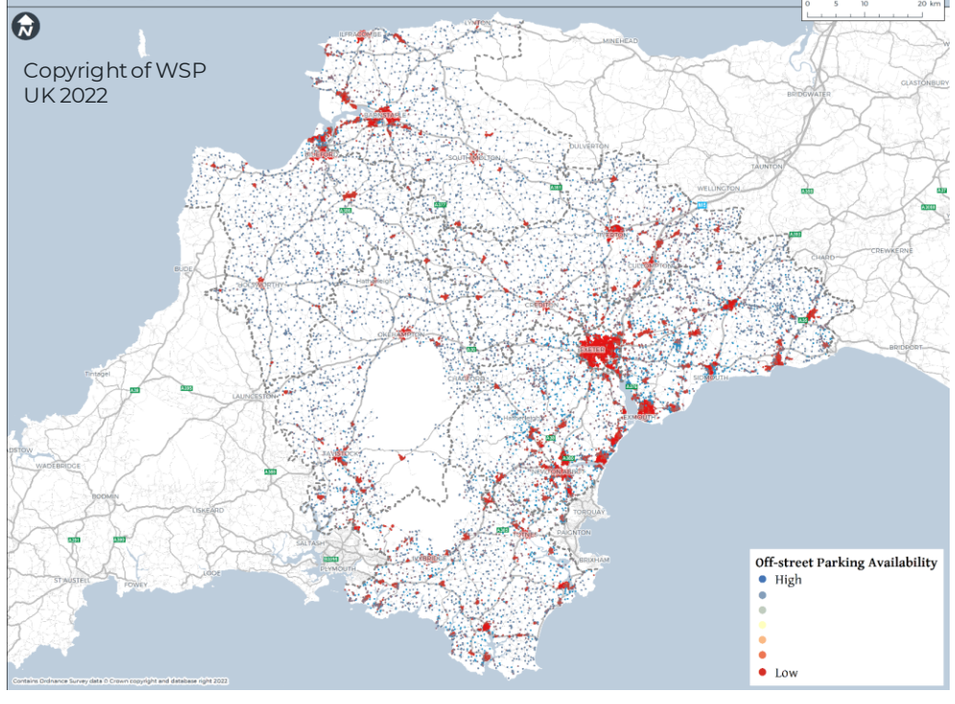


Figure 25 Map of off-street parking availability **(WSP)**



Source: Field Dynamics, WSP

Forecasting demand and charging requirements

EV uptake forecasts - Forecast EV ownership (1/2)

Forecast EV ownership

The EV:Ready model combines the granular data showing factors affecting EV uptake at a local level, as shown in the maps on the previous pages, with regional and national data sets, to calculate **a detailed forecast of EV uptake across Devon up to 2035**.

Figure 26 shows how EV uptake is expected to increase. **In 2033, EV are expected to account for the majority of the fleet for the first time in Devon**. It will then continue to rise up to 2050, at which point it will plateaux at 98% of the total vehicles being electric.

Figure 27 shows the results of the three EV uptake scenarios modelled. The mid scenario represents the most likely level of uptake expected by 2030. However the wide range between the scenarios represents the uncertainties in predicting EV uptake given rapid technological and behavioural change. Government policy, legislation and subsidies are also a key driver which is susceptible to change.

Under the mid scenario it is expected that EV uptake in Devon will rise from 2.0% at present (2022), to 7.1% in 2025, 28.9% in 2030 and 61.6% in 2035.

Table 9 shows how EV uptake is expected to differ between the local authority areas within Devon. **Exeter is forecast to have the highest uptake by 2035** (47.6%) and Mid Devon the lowest (44.0%).

Figure 26 Shift from ICE to EV vehicles in Devon up to 2050 (EV:Ready mid scenario)

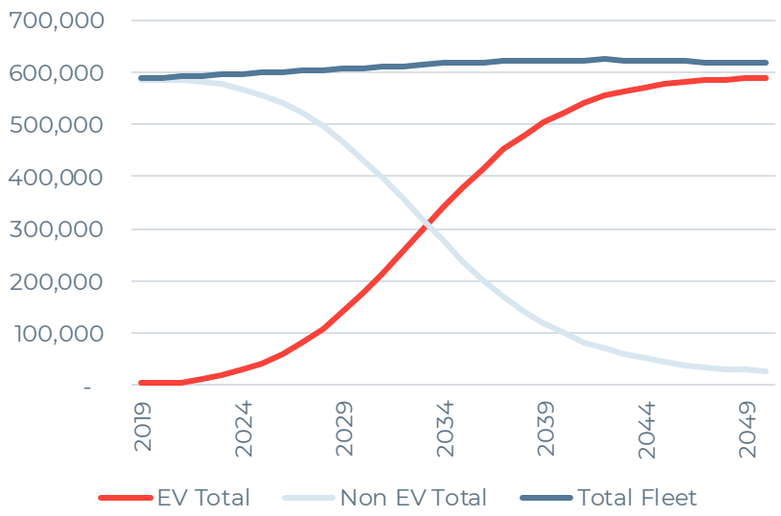


Figure 27 Forecast EV uptake by 2035 (EV:Ready scenarios)

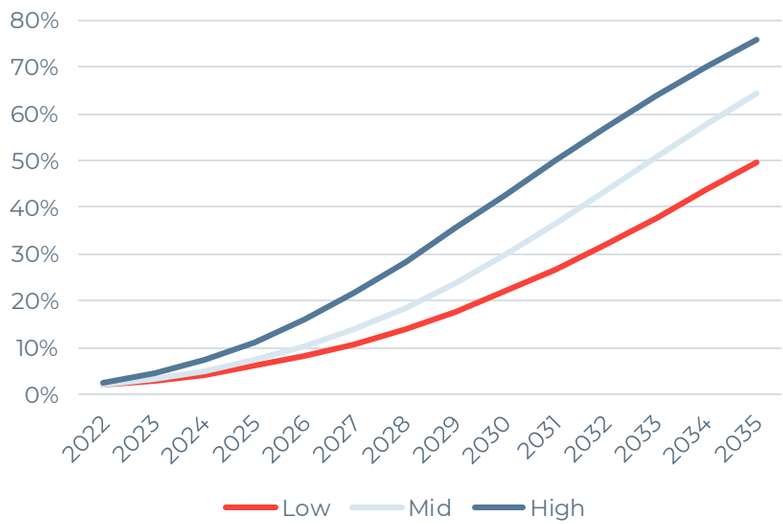


Table 9 Forecast EV uptake by 2035, by local authority (EV:Ready mid scenario)

Local Authority Area	2022	2022 (%)	2025 Mid scenario	2030 Mid scenario	2035 Mid scenario	2025 (%) Mid scenario	2030 (%) Mid scenario	2035 (%) Mid scenario
East Devon	2,178	2.00%	7,894	32,451	69,587	7.18%	29.06%	61.40%
Exeter	1,937	2.33%	5,805	24,095	53,096	6.92%	28.26%	61.36%
Mid Devon	1,104	1.72%	4,436	19,037	41,201	6.83%	28.86%	61.55%
North Devon	1,268	1.80%	4,802	20,423	44,560	6.77%	28.34%	60.94%
South Hams	1,585	2.28%	5,370	21,396	45,277	7.65%	30.02%	62.61%
Teignbridge	2,085	2.10%	7,294	29,766	63,891	7.27%	29.21%	61.79%
Torridge	911	1.71%	3,615	15,545	33,814	6.72%	28.43%	60.94%
West Devon	800	1.79%	3,183	13,468	28,879	7.04%	29.33%	61.97%
Total	11,868	2.00%	42,398	176,179	380,305	7.08%	28.94%	61.57%

Forecasting demand and charging requirements

EV uptake forecasts - Forecast EV ownership (2/2)

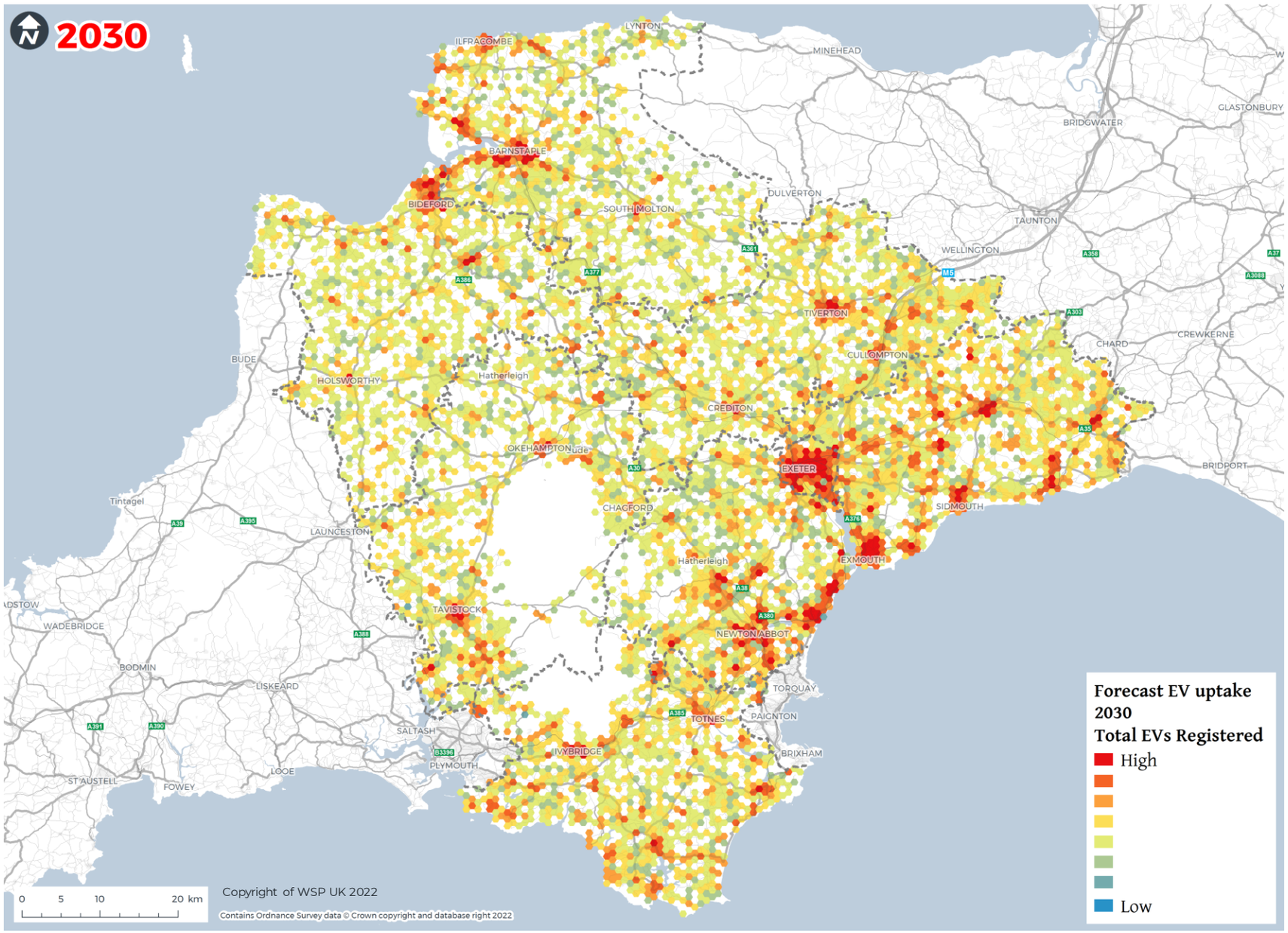
Forecast EV ownership

Figure 28 shows the forecast ownership of EVs in 2030.

The competing influences of the local populations propensity for switching to EV, their car ownership levels, and the extent to which they are reliant on on-street parking, serve to create a **nuanced picture of EV ownership across Devon**, as areas with high propensities towards EV ownership are often partly offset by also being areas of lower car ownership and greater reliance on on-street parking.

There are some prominent areas with high forecast levels of EV ownership, such as Exeter, Barnstaple and Bideford.

Figure 28 Forecast EV ownership – Total EVs registered - 2030



Forecasting demand and charging requirements

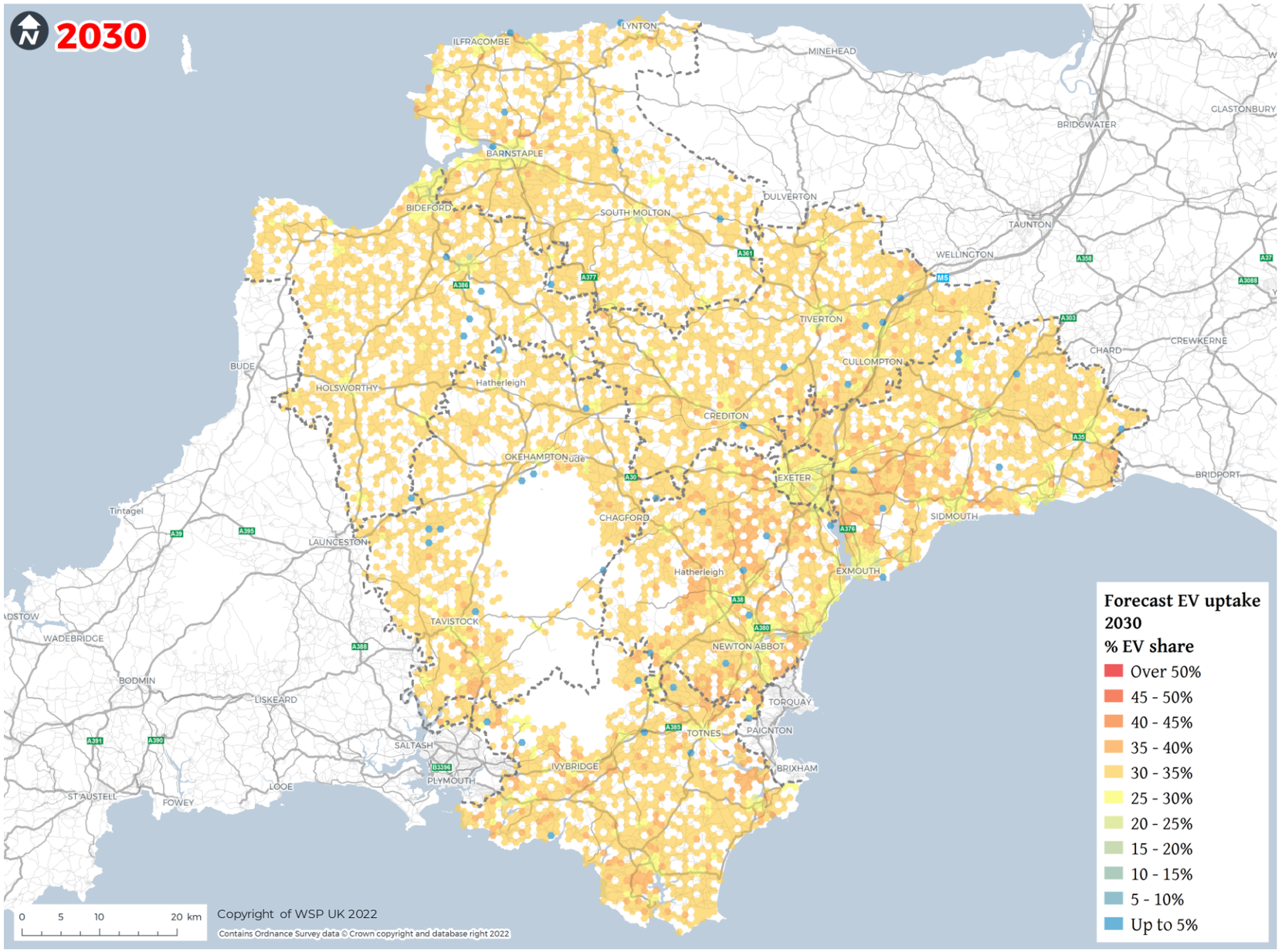
EV uptake forecasts – EV proportion of vehicles registered

Forecast EV uptake – share of vehicles

Figure 29 shows the proportion of total vehicles registered in the county, which are forecast to be EVs by 2030. This gives a clearer sense of where EV ownership is expected to be higher in relative terms, once accounting for difference in the numbers of vehicles registered.

This shows that uptake is forecast to increase throughout Devon, at a relatively consistent rate across the county.

Figure 29 Forecast share of vehicles registered made up of EVs – 2030



Forecasting demand and charging requirements

EV uptake forecasts – EVs per household

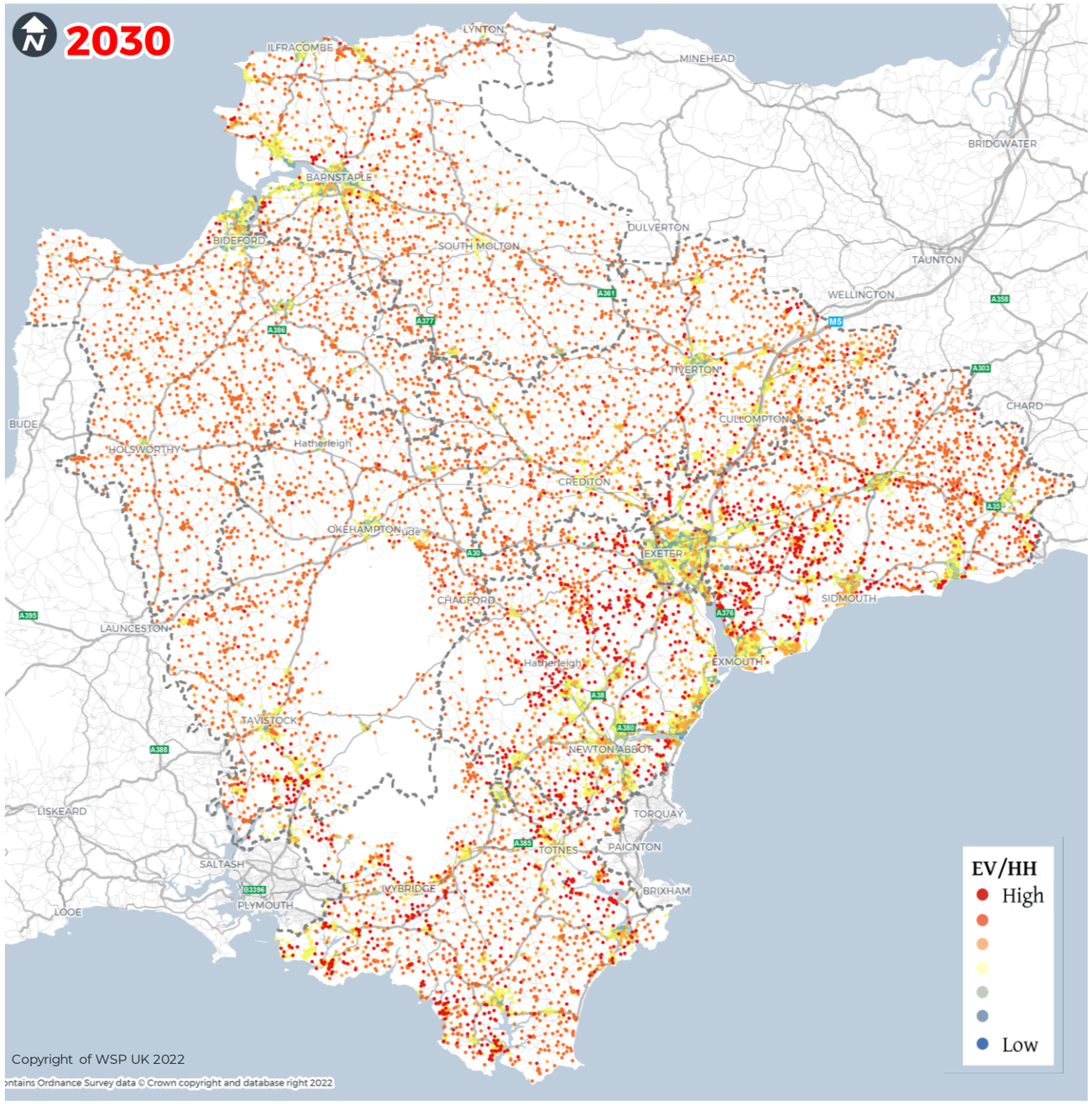
Forecast EV uptake – EVs per household

Figure 30 reports the forecast number of EVs per household, which provides a further means of reviewing how uptake may vary, once accounting for household densities. This illustrates that at a household level, many of the more rural parts of Devon are expected to see relatively high EV registrations, in part reflecting the greater car dependency and increased availability of off-street parking, making it easier to charge at home.

Urban centres such as Exeter, Bideford, Newton Abbott and Barnstaple stand out as areas with a lower ratio of EVs per household forecast.

Across Devon there are 1.3 cars per household, which is slightly higher to the average across England and Wales as a whole, where there are on average 1.2 cars per household.

Figure 30 Forecast EVs per household - 2030



Section 3B: Forecasting demand and charging requirements

EVCP requirement forecasting

Forecasting demand and charging requirements

EVCP requirement forecasting

Forecast EVCP requirements

This section summarises the **forecast demand for EVCPs up to 2025 and 2030**. This is limited to **publicly accessible charge points**.

Three scenarios are presented (low, mid-range and high) which each represent a different ratio of EVs to EVCPs.

- **Low ratio** – fewer EVs per EVCP, i.e. a more generous level of public charging provision, assuming each charger is utilised less intensively, with lower average charging rates.
- **High ratio** – more EVs per EVCP, i.e. fewer public charger points, assuming chargers are optimally deployed, with higher average charge rates.
- **Mid ratio** – a middle ground between these two extremes, with a balanced set of assumptions in terms of technical developments and charging behaviours.

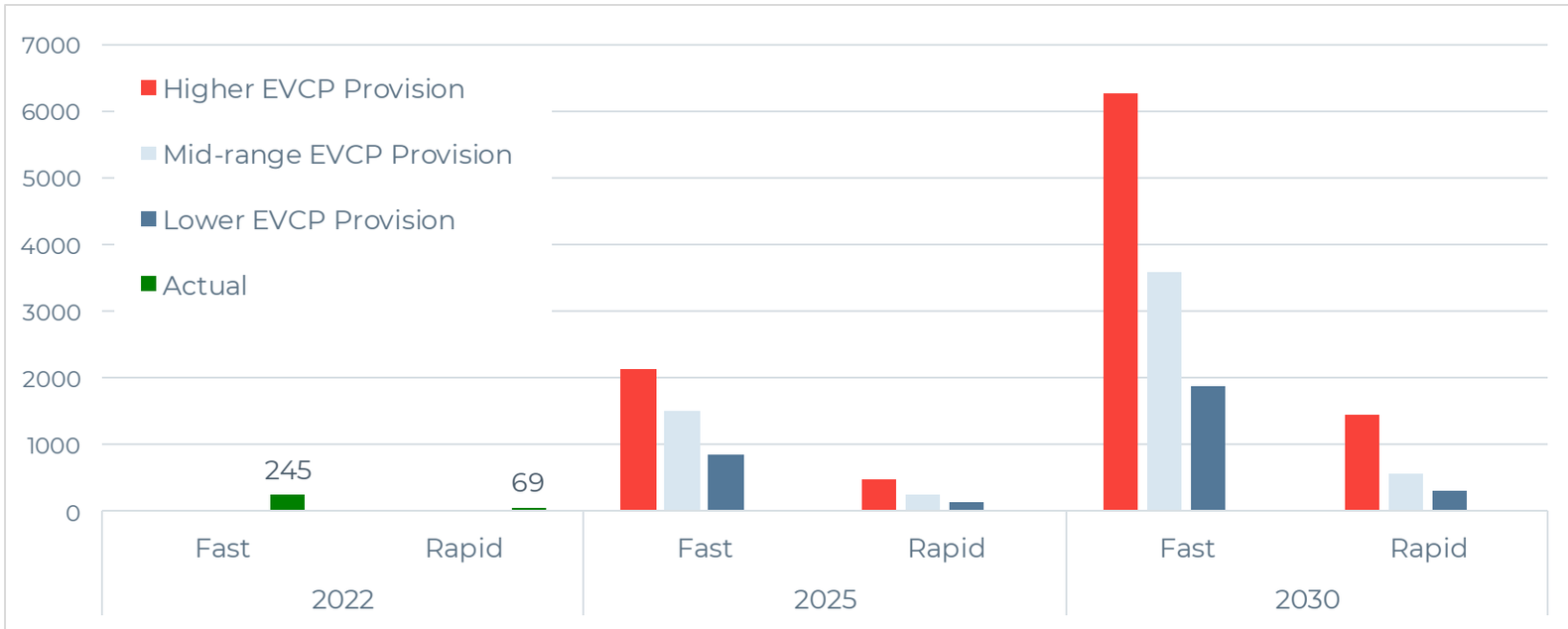
Table 10 and Figure 31 present the forecast EVCP requirements up to 2030. There will be a need for a significant ramp up in the delivery of EVCPs to meet demand – however, the figures presented are estimates.

- **By 2025, a significant increase in the number of public EVCPs is forecast** – circa 1,500 fast chargers and 300 rapid chargers are required in a mid-range scenario.
- **By 2030, EVCP requirements are forecast to accelerate further**, with a requirement in the region of 4,000 fast chargers and 600 rapid chargers in a mid-range scenario.

Table 10 Forecast EVCP requirements (rounded)

Scenario	Forecast EVCPs 2025	Forecast EVCPs 2025	Forecast EVCPs 2030	Forecast EVCPs 2030
	Fast	Rapid	Fast	Rapid
Low	900	100	2,000	300
Mid-range	1,500	300	4,000	600
High	2,100	500	6,000	1,400

Figure 31 Forecast EVCP requirements



Forecasting demand and charging requirements

Demand for residential charging (1/3)

Demand for on-street residential charging

Figure 32 highlights areas where residents are both more reliant on on-street parking, and are also forecasted to experience high levels of EV ownership, relative to the rest of Devon. They should be investigated as a priority during any EVCP site selection processes.

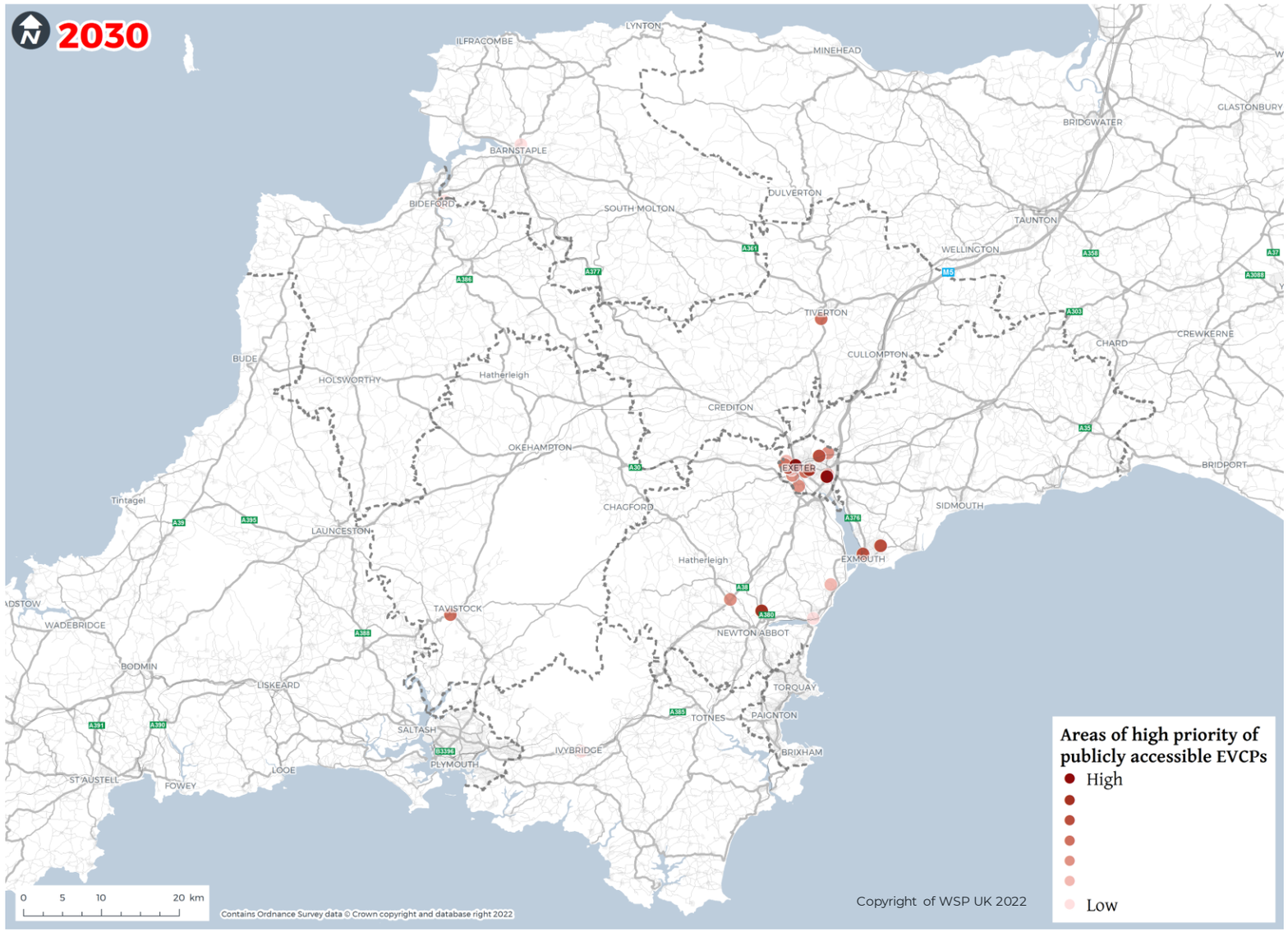
Operating charge points in residential areas with limited off-street parking is challenging for charge point operators who often find they are not commercially viable. Challenges for charge point operators include:

- **High delivery costs** relative to expected sales income.
- **Impact on the local availability of parking**, when spaces are reallocated to dedicated EV bays
- **Challenges in finding available space** for on-street chargers and feeder pillars where footways are narrow, or basements, trees and other street furniture prevent deployment.

However, some of these are expected to be of interest to private charge point operators, particularly as the market and the appetite for investment is moving quickly. For example, Rapid Charging Devon are installing rapid chargers.

On-street charging points at these locations, or residential charging hubs in nearby off-street car parks are important to enable EV uptake in these areas.

Figure 32 Areas of high priority for publicly accessible EVCPs (areas with high demand for EV and reliance on on-street parking)



Forecasting demand and charging requirements

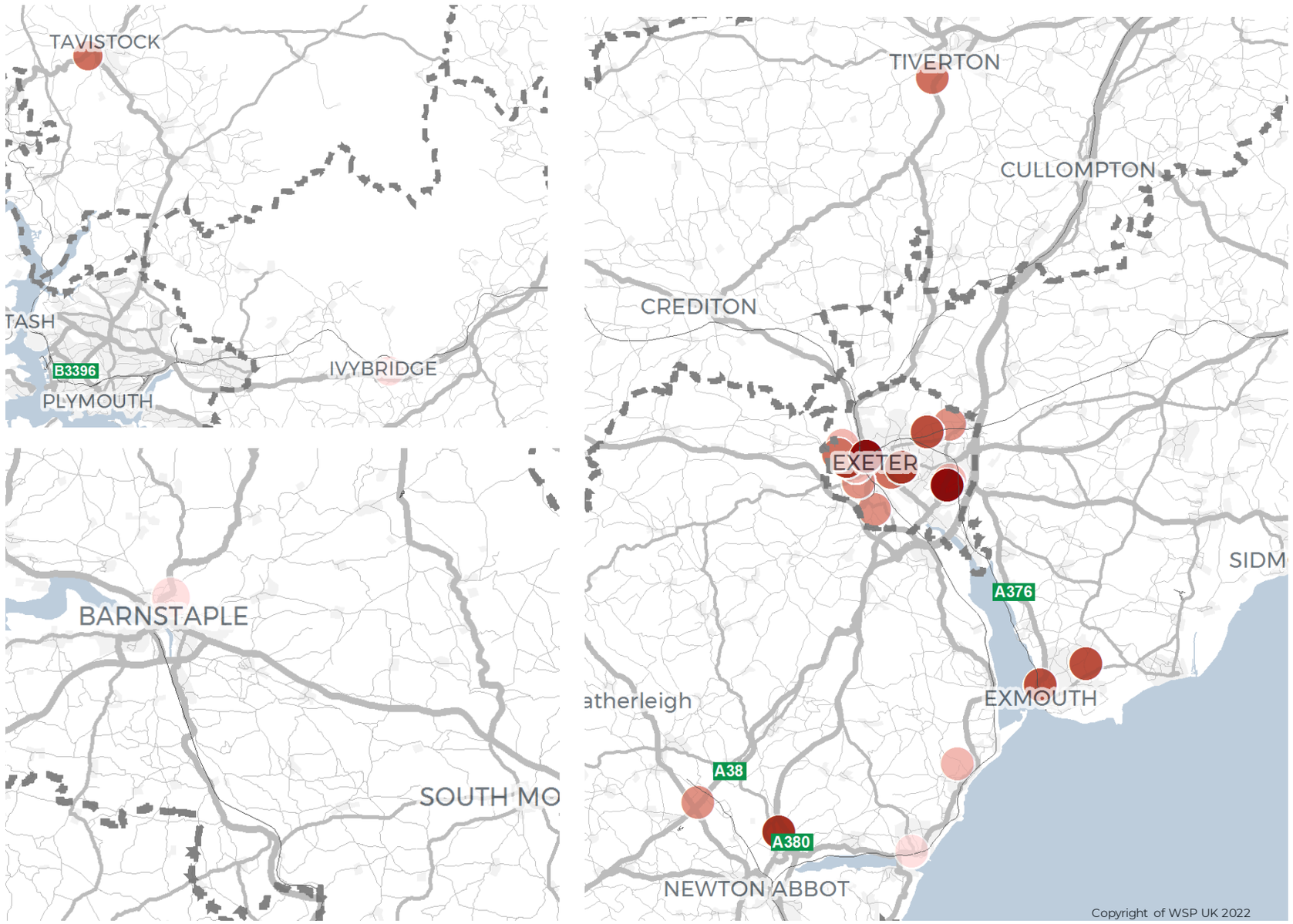
Demand for residential charging (2/3)

Demand for residential charging

Figure 33 shows the areas where residents are more reliant on on-street parking and are forecast to experience high levels of EV ownership in further detail.

This does not take predicted private sector supply into account.

Figure 33 Areas of high priority for publicly accessible EVCPs in detail (areas with high demand for EV and reliance on on-street parking)



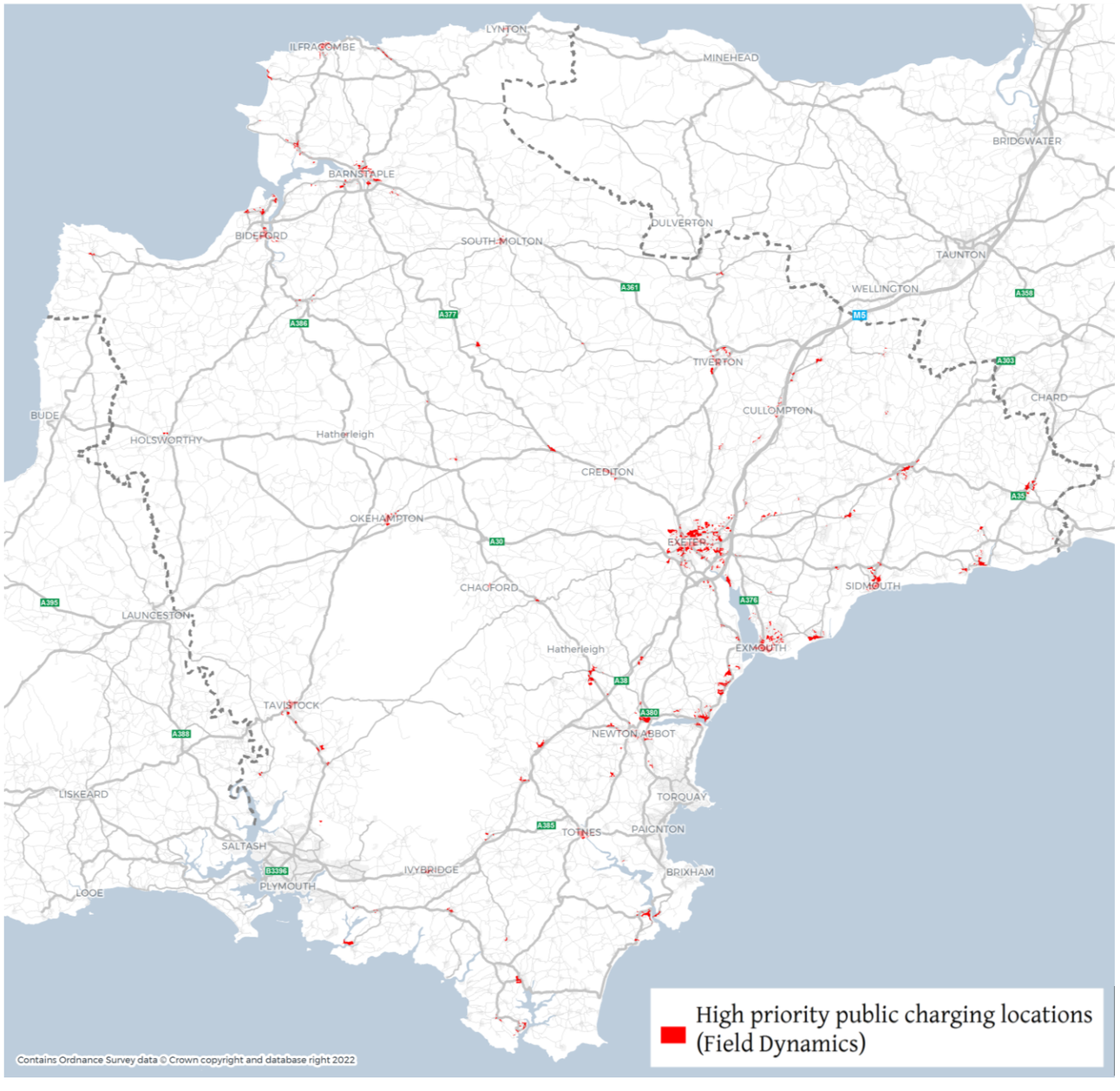
Forecasting demand and charging requirements

Demand for residential charging (3/3)

Demand for on-street residential charging

Figure 34 provides alternate modelling conducted by Field Dynamics, showing areas that are higher priority for public charging. This demonstrates overlap with **Figure 32**, with key demand for public charging expected in areas with lower levels of off-street parking, such as Exeter.

Figure 34 Areas of high priority for publicly accessible EVCPs - **Field Dynamics**



Forecasting demand and charging requirements

Spatial analysis

Spatial analysis of public EV charging demand

Based on the preceding analysis of the potential requirements for public EVCPs, spatial analysis of the likely distribution of EVCP demand was undertaken. This analysis is informed by:

- Forecast EV uptake by postcode
- Number of destination land uses by postcode
- Proximity to high traffic volumes
- Reliance on on-street parking

Figure 35 shows how the level of demand for EVCPs will be distributed across Devon by 2030.

The areas of greatest demand are located where EV uptake is forecast to be high and there is limited private off-street parking where drivers could charge their vehicles. The map demonstrates that these areas are generally more urban, and in close proximity to major roads. Demand is particularly high in Exeter.

Figure 36 shows how likely the private sector is to invest in EVCPs across the region. Whilst this appears to indicate good coverage across Devon, maps shown on pages later in this report show the key areas where gaps have been identified.

Figure 35 Forecast distribution of EVCP demand, 2030

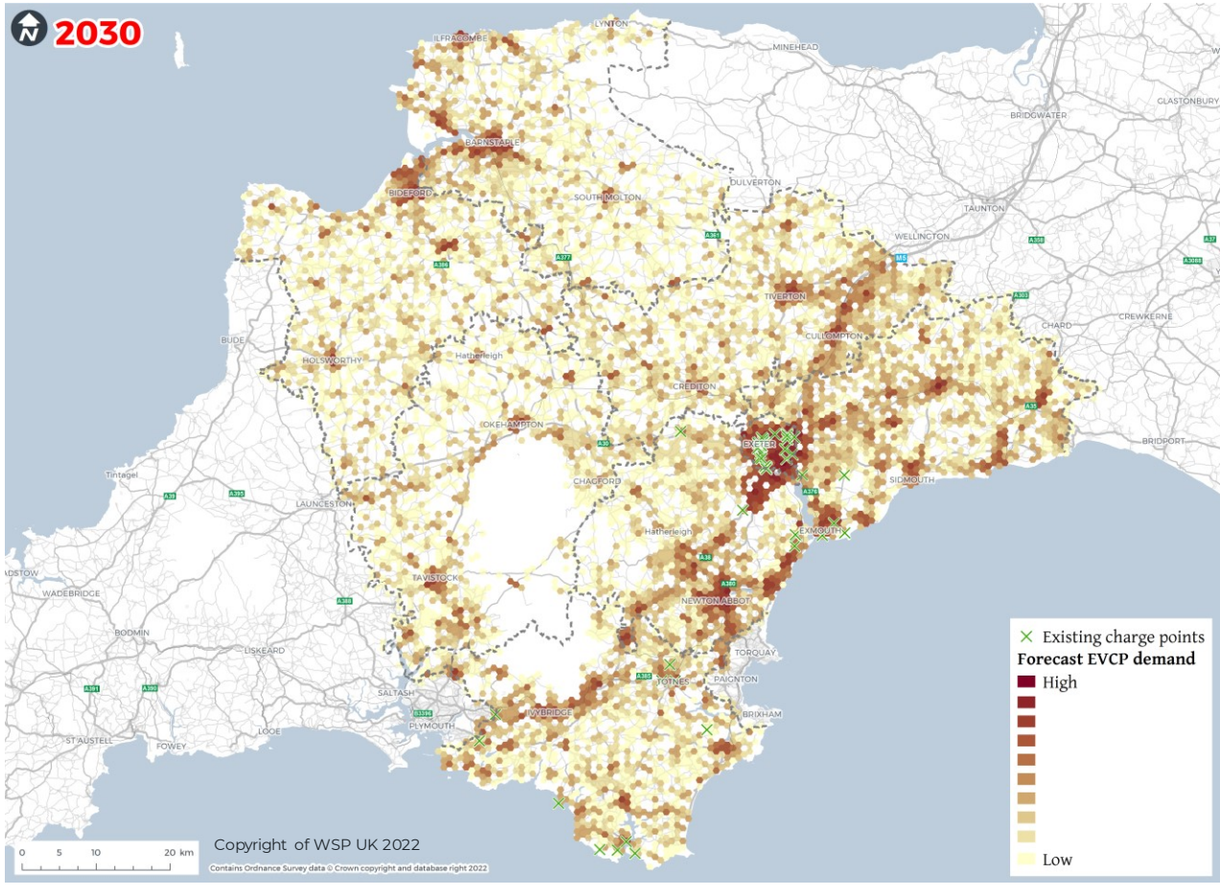
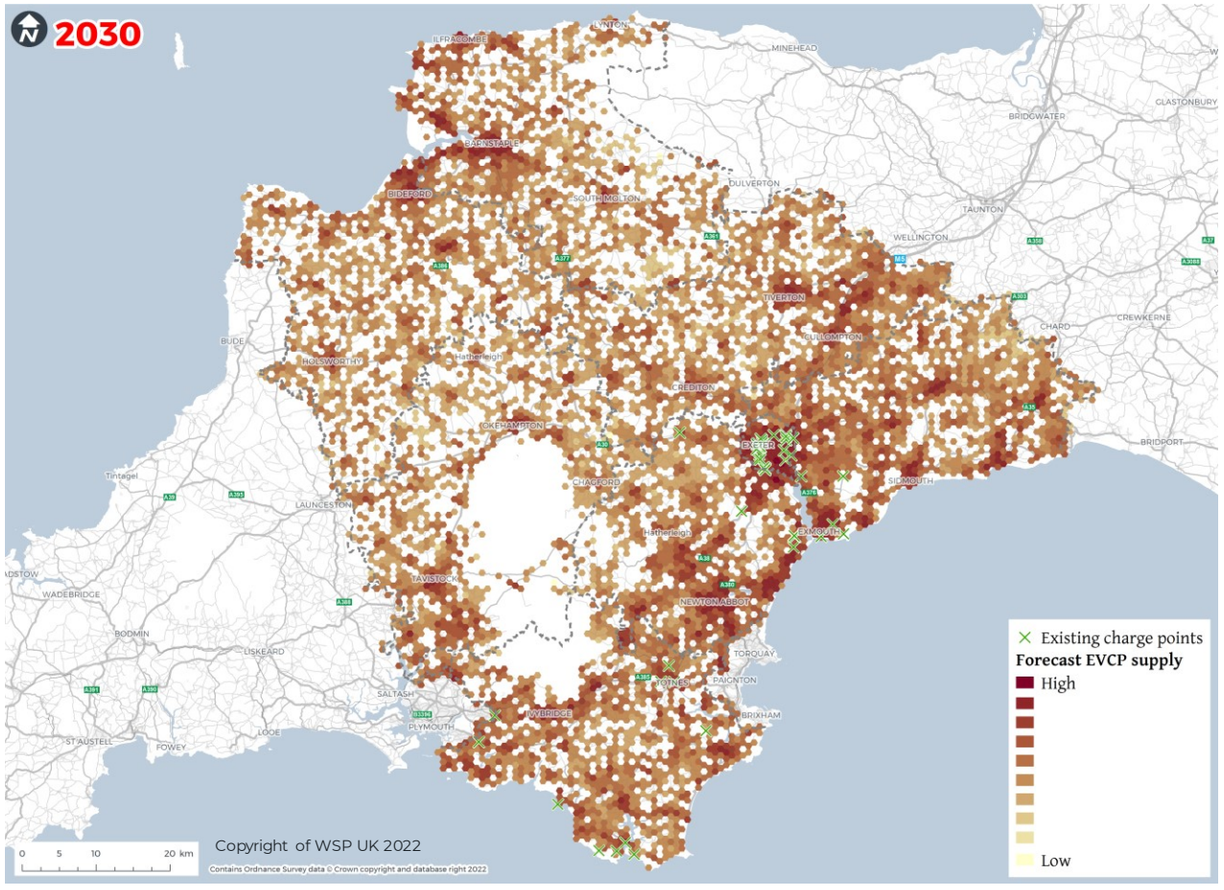


Figure 36 Forecast distribution of EVCP supply, 2030



Forecasting demand and charging requirements

Private sector supply

Supply of publicly accessible chargers by the private sector

There is a keen appetite to invest in EV charging infrastructure from the private sector, with a number of large operators having established themselves, as well as new entrants and acquisitions by major investors.

In order to understand the extent to which the private sector may cater for the forecast demand for EV charging, analysis was undertaken to consider the relative attractiveness of sites across Devon for private sector EVCP investments.

The forecasts for EVCP supply are based on insight from charge point operators, including their deployment strategies, and the key parameters they consider when determining the likely commercial viability of a site. This insight shows:

- Commercial charge point deployments are typically focused on destinations and intermediate sites (i.e. service stations, petrol stations, roadside cafes).
- Chargers are more likely to be delivered on a fully funded basis where demand is high, with high traffic volumes or reasonable dwell times.
- Prime sites and strategic partnerships with major chains are a key driver of commercial charge point delivery, including sites that provide attractive waiting facilities / amenities.
- Rapid chargers are more likely to be commercially deliverable by the private sector than standard / fast chargers.
- Around 33-50% of sites considered typically do not have sufficient electrical capacity to deliver fast / rapid charging hubs, and the cost of upgrading the connection makes them commercially unviable.
- A number of private sector operators noted that they anticipate that the market will moving towards ultra rapid chargers within the next 10 years.
- On street residential chargers are challenging to deliver on a commercial basis, and so are generally grant funding led, though some private sector operators will part fund on street chargers.
- Private sector operators preference is typically for off-street car parks , due in part to delivery issues over on street EVCPs, including resident objections to TROs.
- Some private sector operators note a focus on roadside retail and small convenience outlets sites, moving away from forecourt / petrol station market where they offer a poor retail experience, given the longer dwell times at the sites.
- For commercial deployments, private sector operators may seek to avoid over-saturating markets with chargers and cannibalising their own charge point utilisation.
- Private sector operators approaches to EVCP deployment varied from detailed modelling and site identification, to partnership models, and from installing ahead of demand to aligning with EV growth, with some estimates that by 2030 around 50-80% of public EVCPs might be delivered by the private sector, whilst others felt it was more art than science when it comes to forecasting future EV charge point requirements.

The EVCP forecasts also take other factors into consideration, including the current split between public and private sector funding, vehicle mileages, and charging locations.

Forecasting demand and charging requirements

Forecast EVCPs requiring public sector intervention

Indicative forecast for EVCPs requiring public sector intervention

Whilst the private sector will provide a proportion of the infrastructure required in Devon, forecasts indicate that public intervention is needed for a proportion of Devon's EVCPs to meet demand and reduce any gaps based on the private sector provision.

Figure 37 and Table 11 show a **forecast of EVCPs which the public sector will be required to install, within each of the authority areas.** Numbers shown are indicative only and are intended to provide a broad suggestion of the volume of charge points required.

Over time utilisation rates will rise and EVCPs become more profitable, allowing the private sector to invest more widely. However for the period modelled **the demand for public sector interventions is still expected to increase year on year, given the increasing overall demand**.

The areas where low levels of private sector provision of EVCPs and **where gaps in the charge point network are most likely to occur**, include:

- **Remote areas with low demand**, including more rural and sparsely populated areas.
- **Rural or secondary routes with moderate levels of demand**, but with fewer destinations (retail stores, food outlets etc) to serve as a platform for charge point rollout.
- **Areas with constrained grid capacity**, where the costs of installing a DNO connection are expensive making them commercially unviable for the private sector.

Figure 37 Forecast requirements for EVCPs requiring public sector intervention

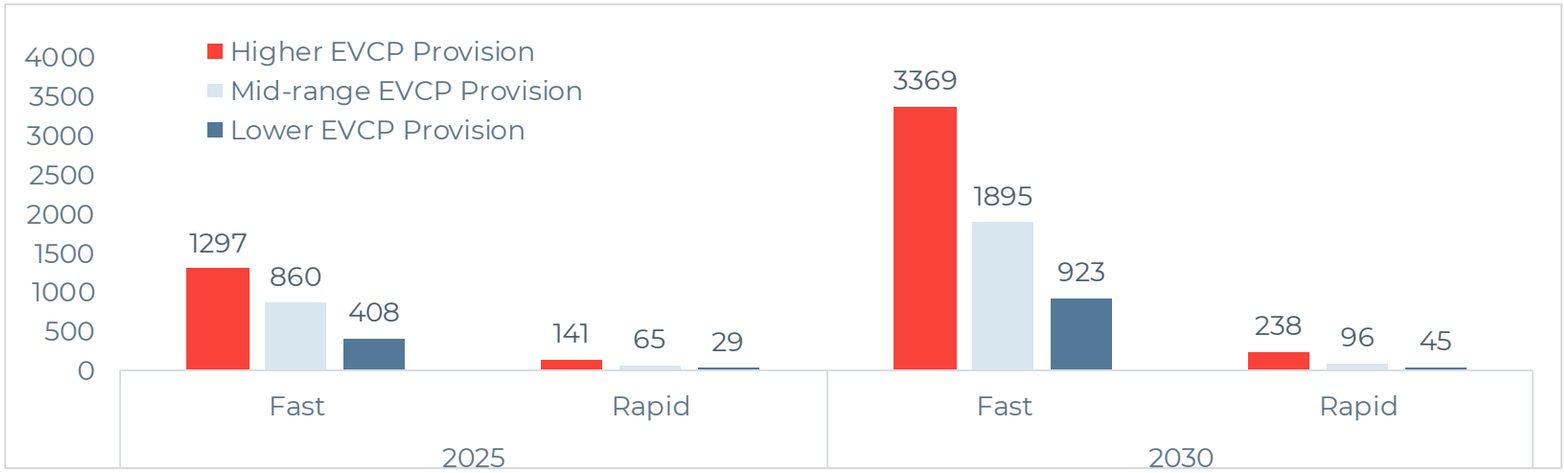


Table 11 Mid-range forecast, EVCPs requiring public sector intervention, by area

Area	Forecast EVCPs 2025	Forecast EVCPs 2025	Forecast EVCPs 2030	Forecast EVCPs 2030
	Fast	Rapid	Fast	Rapid
East Devon	157	12	345	17
Exeter	116	9	256	13
Mid Devon	92	7	202	10
North Devon	99	7	217	11
South Hams	103	8	227	11
Teignbridge	144	11	316	16
Torridge	144	11	316	16
West Devon	144	11	316	16
Total	860	65	1895	96

Forecasting demand and charging requirements

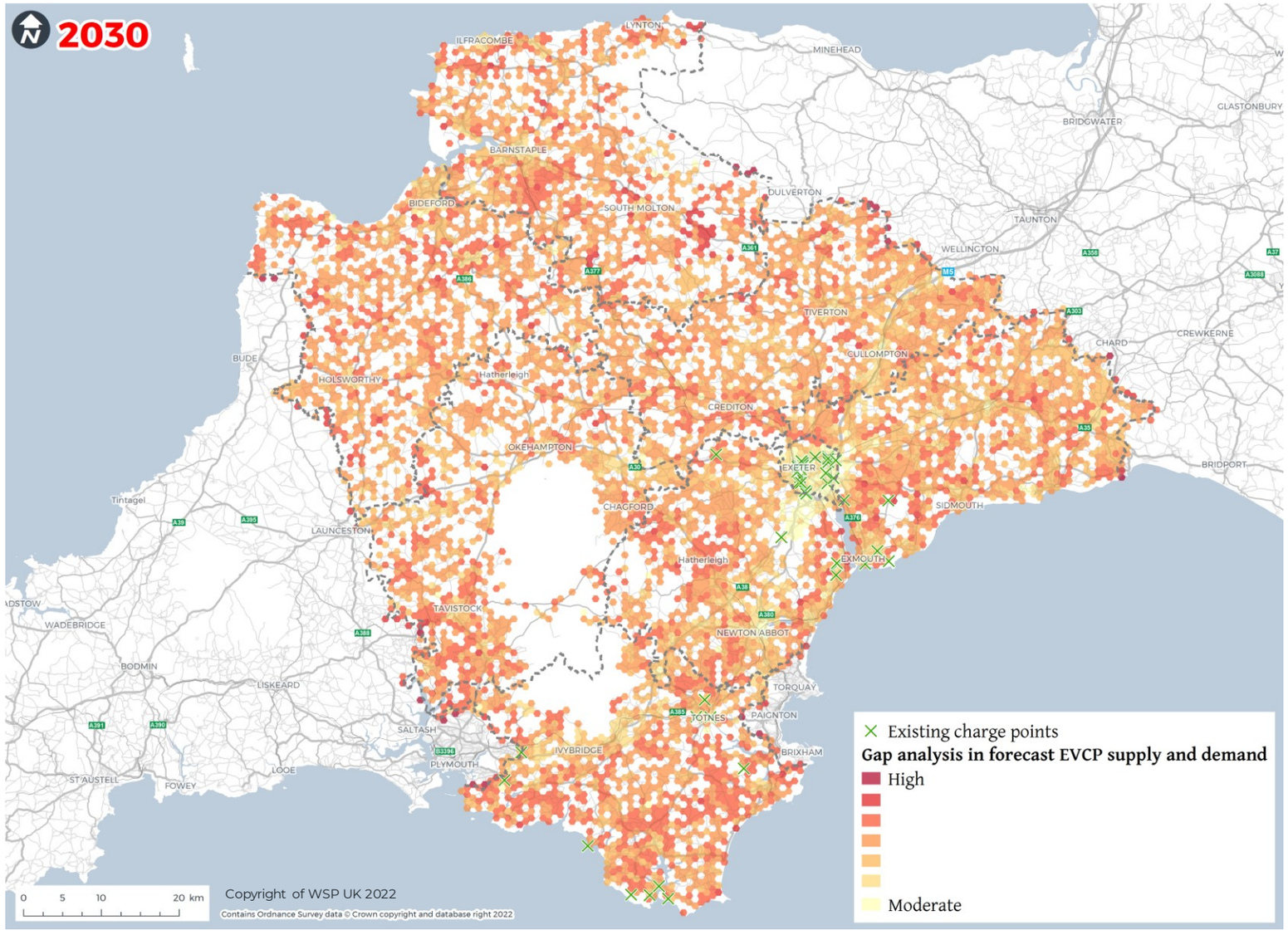
Forecast gaps between EVCP demand and supply (1/2)

Forecast gaps in provision of charging infrastructure

Based on the preceding analysis of the potential demand for public EV chargers, and an understanding of which type of locations are more likely to be fulfilled through the private sector, an assessment can be made of the areas where gaps in charge point availability are more likely to arise.

Figure 38 provides a high-level indication of these gaps, as the difference between the charge point demand and supply ratings at a local level. The red points show areas where gaps in EVCP provision are most likely to occur and yellow points are the moderately likely. The results indicate the areas where gaps in the charge point network are thought most likely to occur.

Figure 38 Forecast charge point demand/supply gap analysis



Forecasting demand and charging requirements

Forecast gaps between EVCP demand and supply (2/2)

Forecast gaps in provision of charging infrastructure

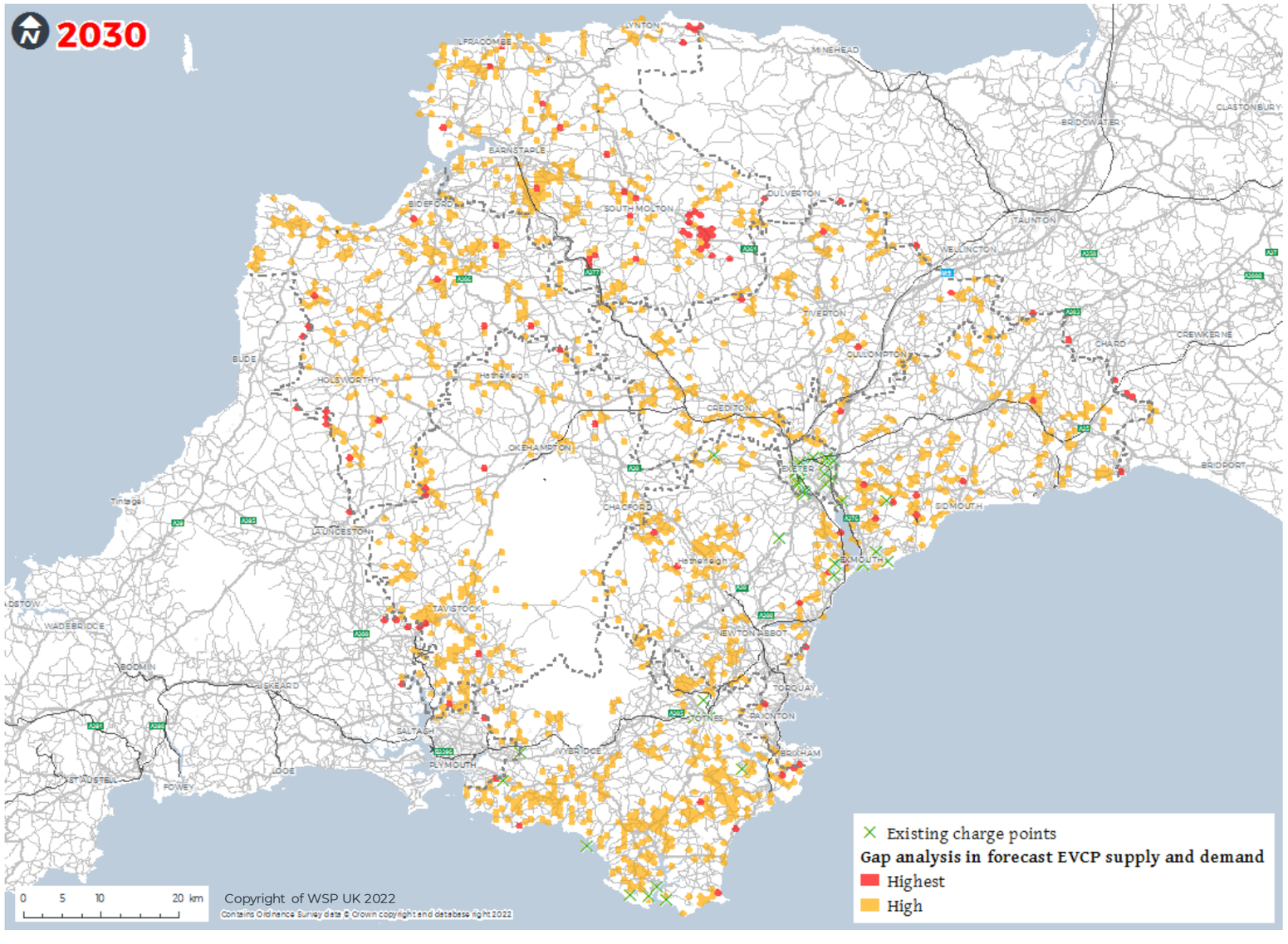
Figure 39 shows the top priority areas where there are expected to be gaps between forecast demand and private-sector supply. This looks and both supply and demand.

This demonstrates that there are expected to be gaps across Devon, and DCC will consider how to serve those areas where demand may not be fulfilled by the private market.

Whilst these are the areas that are unlikely to be well served by the private sector, DCC should consider creating a portfolio, so that the less desirable EVCP sites and packaged up with sites that are more desirable to charge point operators.

Note: Hex cells are used to graphically represent distinct areas of Devon. Where a hex overlaps a boundary yet still contains some population data from within the study area, it has been included.

Figure 39 Forecast charge point demand/supply gap analysis – areas with the highest gaps only



Stage 3C: Delivery Models

Delivery models
Delivery models (1/2)

Delivery models

Although the EVCP market is changing rapidly, there are currently three broad categories of delivery models. These are outlined below.

DCC are currently operating a form of concessionary model, working in partnership with multiple landlords e.g. district councils. It is recognised that there are benefits to this approach, including the ability to retain control over the network and ensure that EVCPs align with Devon's policy goals. However, there are also challenges relating to the high level of DCC resources required and complexity (such as entering into leases).

Table 12 Advantages and disadvantages of the various delivery models

Delivery Model	Potential Control/ Income	Potential Risk/ Control	Advantages	Disadvantages
Public Ownership All charge point costs are paid for by the public sector, with capital and maintenance costs recouped from usage charges. Charge points are owned by the public sector and operated and maintained via contract to a third party			• Highest potential income for public partner • Full control over locations and pricing • Easiest to incorporate wider environmental and social value goals	• Requires significant internal / external funding • Highest risk in terms of ongoing liability, stranded assets, and maintenance costs • Use of public funds comes with accountability to taxpayer and political risk
Public / private funded concessionary model Charge points are funded or part-funded by the public sector. The private sector partner then operates and maintains the charge points for an agreed period under a revenue share agreement			• Potential income from public partner through income share • Reduced risk for public sector • Depending on agreement, public sector may maintain ongoing ownership, and can incorporate wider goals	• Reduced income share compared to full ownership • Tender process can add complexity and risk • May need a minimum number of sites (>25) • Potential for disputes over responsibility for site failures and expensive termination clauses
Private ownership All costs are borne by the private sector partner, with a long-term lease/licence over which they can recover their costs			• Lowest risk to public partner • Rental agreements can provide guaranteed income over a number of years	• Lowest potential income • Least control and ability to incorporate wider goals • Likely to involve long agreement periods or exclusion areas • Less commercially attractive sites may not be covered

Delivery models
Delivery models (2/2)

Delivery models

Though the debate surrounding public sector involvement is recongised, based on the advantages and disadvantages of the different models, and from engagement, the **concessionary model, with a private sector delivery partner provides a good balance of risk and control.**

This is similar to the WSCC case study example, whereby a portfolio approach was used. This means that **financially unviable sites for private operators are packaged up with sites desirable to CPOs to cross subsidise costs**. This approach will particularly benefit rural areas.

Private sector partnership working can enable **delivery at pace**, and avoid DCC being left with expensive and difficult to deliver sites in hard to deliver areas, incurring additional costs for future budgets. This approach would play a role in ensuring equitable transport is provided across a diverse geographical area – ensuring that the less desirable locations are also able to secure an EVCP provision.

To deliver this, **DCC could contract with partners for each market segment – for example, identifying a partner for on-street EVCPs and for car park EVCPs**. On the other hand, DCC could contract with one partner for all location types, to provide a valuable exclusivity proposition to the market.

DCC would be required to select specific sites for EVCPs, but this could be done in partnership with the private sector partner. A formal site selection process should be undertaken, which will determine the number of sites to be included and ensure that the areas where there are expected to be gaps, between forecast demand and private-sector supply, are fulfilled.

This model relies on **carefully designed concession agreements** and advice should be sought from commercial colleagues to inform this approach.

Case study: West Sussex County Council (WSCC)

WSCC, in partnership with the district and borough councils of Adur and Worthing, Arun, Crawley, Horsham, and Mid Sussex, plan to deliver the UK's largest EVCP deployment using an alternative delivery model which is procurement-led. Typically, local authorities complete network planning, secure funding for delivery and then open procurement to CPOs. However, WSCC have taken the reverse approach to tendering. Instead of the network planning being part of the tendering, WSCC first went out to procurement to appoint a CPO supplier who will undertake the network planning and delivery, with the expectation that the CPO would fully fund the project and liaise with the DNO, and subsequently manage and maintain the EVCPs on an ongoing basis.

The procurement tender was broad, although WSCC did set minimum standards for charger types (not less than 7kw) and an expectation that they would also deliver some rapid chargers and no lamp column chargers. WSCC set a percentage limit on the number of rapid chargers that could be delivered as part of the network. WSCC identified 10 priority sites for charging infrastructure, however, they did not specify the numbers of EVCPs to be provided at each site.

The CPO undertakes network planning and once this is agreed with WSCC the CPO is obliged to deliver 10% of the overall estimated volume of charge points required to be delivered by 2030, in the first year. The CPO is able to apply for funding opportunities, such as ORCS, on WSCC's behalf. The CPO required a long contract length (15+ years) to provide assurance of return of investment.

During the tender process WSCC asked CPOs to define a maximum value they would be prepared to pay for grid connections. A portfolio approach was then taken where financially unviable sites were packaged up with sites desirable to the CPOs, to cross subsidise the costs and on average the connection costs remained below the average.

The WSCC approach provides an alternative blueprint for how local authorities can leverage private sector investment to achieve the ambitious large scale EVCP rollouts required to meet their air quality and climate change objectives.

Delivery models
Funding for EVCPs

Government funding schemes

When considering publicly funded EVCPs, **opportunities should be identified for additional grant funding**, as has already been explored by DCC. Whilst the private sector is likely to invest in EV infrastructure in Devon, there are expected to be gaps in the provision.

Funding should be prioritised for the least commercially viable sites.

Table 13 Example public sector funding schemes

Funding Scheme	Description
Workplace Charging Scheme (WCS)	A voucher-based scheme to provide eligible applicants with support towards the cost it's of the purchase and installation of EVCPs. The contribution is limited to 75% of purchase and installation costs, up to a maximum of £350 for each socket, up to a maximum of 40 across all sites for each applicant. Since 2016, the scheme has supported over 22,000 EVCP installations.
On-Street Residential Chargepoint Scheme (ORCS)	Provides local authorities with grant funding that can be used to part-fund the procurement and installation of on-street EVCP infrastructure to meet residents needs. The funding available contributes to the capital costs of procuring and installing the EVCP and an associated dedicated parking bay. The scheme has supported 2,038 EVCPs to date with a further 4,539 planned for 2021-22.
Local EV Infrastructure Fund (LEVI)	A new £450 million fund to facilitate the rollout of larger-scale EVCP infrastructure projects, including local rapid hubs and larger on-street schemes not captured by ORCS. £10 million pilot to be launched.
Rapid Charging Fund (RCF)	A £950 million fund to future-proof electrical capacity at motorway and major A-road service areas for the installation of EV infrastructure. Under development.

Section 4: Recommendations

Recommendations (1/3)

1. Accelerate charge point deployment to promote EV uptake

A range of forecasts for EV uptake and charge point requirements have been developed. **DCC will plan to provide EVCPs on the basis of a mid-range scenario** of 2,000 EVCPs by 2030 (this is the number of EVCPs requiring public sector intervention).

2. Focus on residential charging: fill the gaps in the private sector residential provision and intervene to ensure that there are 2,000 publicly accessible EVCPs in Devon by 2030 (2,000 EVCPs that are provided by public sector intervention, in addition to EVCPs provided by the private sector).

As the private sector is expected to focus on other markets, DCC will focus on the provision of suitable residential charging. Using the definition outlined in the government's EV Infrastructure Strategy, residential charging refers to on-street charge points (standalone or integrated into street furniture such as lampposts) and residential charging hubs (communal parking areas with EVCPs for residents). DCC will set an **aspirational target**, to ensure that **there are 2,000 publicly accessible charge points in Devon by 2030** (provided by public sector intervention, in addition to EVCPs provided by the private sector.)

DCC will ensure gaps in the private-sector EVCP provision are met, with key consideration given to:

- Areas with **grid constraints** (Fig. 19/20, page 26)
- Areas where **higher uptake of EV** is forecast (Fig 22, page 30)
- Areas **without access to off-street parking** (Fig 24/25, page 32)
- Areas where there is a **gap in EVCP demand and supply** (Fig. 38 and 39, pages 45 and 46)
- Areas with high levels of rurality

To achieve this coverage, DCC will use a range of charging types:

2a. Provide on-street residential chargers: Where there is demand and it is feasible, DCC will deliver on-street standard/fast EVCPs. This will depend on factors such as parking stress, availability of physical space on the highway, and compatibility of lamp columns for installation of chargers. Is recognised that in many areas of Devon, lamp column charging will not be viable, due to streetlighting columns being moved away from the kerbside, and limited power availability.

2b. Test on-street residential pavement gullies: As on-street EVCPs cannot be provided in all areas, DCC will explore the use of pavement gullies to enable residents to charge without trailing cables. Subject to legal advice, **DCC will test the use of pavement gullies in four areas** to understand how they could be used to enable EV uptake. Based on the pilot findings, DCC will formalise a position on trailing cables and provide **public guidance**, which should be kept under review.

2c. Deliver off-street residential hubs: Whilst the private sector will deliver some residential hubs, DCC will also ensure that **all council-owned public car parks have fast or rapid EVCPs**, to provide access to chargers for those who cannot charge vehicles on-street.

DCC will also identify where there are **overlaps between areas of need and council or district owned assets to see if publicly-accessible charging could be installed**.

3. Plug gaps in private-sector destination and intermediate charging provisions

DCC will actively identify sites where destination and/or en-route charging could be installed to meet market need. DCC will then work with landowner, community, public sector and private sector stakeholders to facilitate installation of rapid charging hubs.

4. Follow best practice design principles

Each site needs to be considered on its own merits, but for most locations, **fast chargers (7-22kW)** would be appropriate. **Rapid chargers (50-150kW) should be deployed where dwell times are shorter** (approximately one hour or less).

EVCPs should be **futureproofed to support higher charge rates or changes to technology** in future, with use of smart chargers, a passive charging provision and ensuring charge points can be repaired and upgraded.

EVCPs should be **delivered in clusters where possible** (minimum of two), with multiple units provided at each site as this reduces the risk of a driver arriving at the site and being unable to charge.

DCC will proceed with **in-depth site selection, soft market testing and review partnership concession agreements**.

Recommendations (2/3)

5. Leverage private sector funding, but retain control through a concessionary approach with a private sector delivery partner

The debate surrounding public sector involvement in the delivery of EVCP is recognised. DCC will seek private sector investment to expand the local charging network, with a **public and privately funded concessionary model**. In this delivery model, EVCPs are funded or part-funded by the public sector. Private sector partners operate and/or maintain the EVCPs for an agreed period of time. This enables DCC to package-up less profitable sites with more profitable ones, particularly to benefit rural areas.

6. Seek national funding to support EVCP aspirations

To supplement budgets, funding will be sought, which could include the **Local Electric Vehicle Infrastructure (LEVI)** scheme and the **UK Shared Prosperity Fund**.

7. Leverage scale through Devon-wide funding applications and procurement

DCC will seek to collaborate with local districts and other strategic partners when applying for grant funding, procuring services, and delivering the strategy. Engaging charge point operators for larger schemes which extend across the county will be more commercially attractive and allow favourable terms to be agreed. This is of particular importance if trying to package up more and less commercially viable sites together.

The later point will be of growing importance as the private sector captures the most profitable locations and Council-led projects are more and more focused on unprofitable areas, that no private investor will cover. It is to be noted that most funding schemes do not cover revenue costs, so balance between profitable and unprofitable sites should be kept in packaging contracts. This should also include monitoring the evolution of DCC charge point running costs and public and private charging points enforcement cost, to avoid creating unforeseen expenses to the council.

8. Lead on local district co-ordination

DCC have a unique role in being able **to co-ordinate district councils**, and DCC will set up and lead local working groups.

There are clear benefits of ensuring local councils are co-ordinated, including strengthened funding bids, sharing of best practice, consistency of technical standards, and better strategic planning to avoid gaps in EVCP provisions.

DCC will coordinate with district councils to ensure Local Plans and EV policies are consistent. This will include supporting planning authorities to determine whether more ambitious development policies and regulations should be introduced.

9. Monitor EV uptake and charge point provision

DCC will develop a monitoring framework to **annually track whether EV uptake and the roll-out of EVCPs are aligned with forecasts** in this document. This would include monitoring EVCPs delivered by the private sector through the National Chargepoint Register and Open Charge Map datasets.

10. Ensure EV design considers diverse user needs

As EVCPs are introduced, DCC will need to understand the different types of users and non-users of EVs, to **ensure the design and delivery approach used does not negatively impact some groups of residents or visitors**, such as businesses or those with accessibility needs.

DCC will focus on ensuring that charge points can be accessed by all, and use government accessibility guidance.

Concessionary contracts should include assurances to **offer residents seamless access to charging services**. This should mean a single or limited number of online platforms and apps to access charging services, as well as well-maintained and accessible devices, offering common charging technologies. In particular, lessons learnt from Rapid Charging Devon have highlighted the need to maintain a minimum distance around EVCPs to create more space for people walking and wheeling. Wherever possible, EVCPs will be sited on build outs. EVCP cable management must also be considered.

Recommendations (3/3)

11. Raise public awareness, including of the peer-to-peer charging network

DCC and partners will develop a **communication strategy to drive EV uptake, to include promoting the benefits of EVCPs to residents and businesses.**

Communications could also include highlighting local EVCPs and the peer-to-peer charging network (such as Zap-Home and Co-Charger, which provide the opportunity for owners to charge for use of their charge points).

As **workplace charging** can provide an opportunity to provide EV charging for those without access to off-street parking, DCC will **engage with major local employers**.

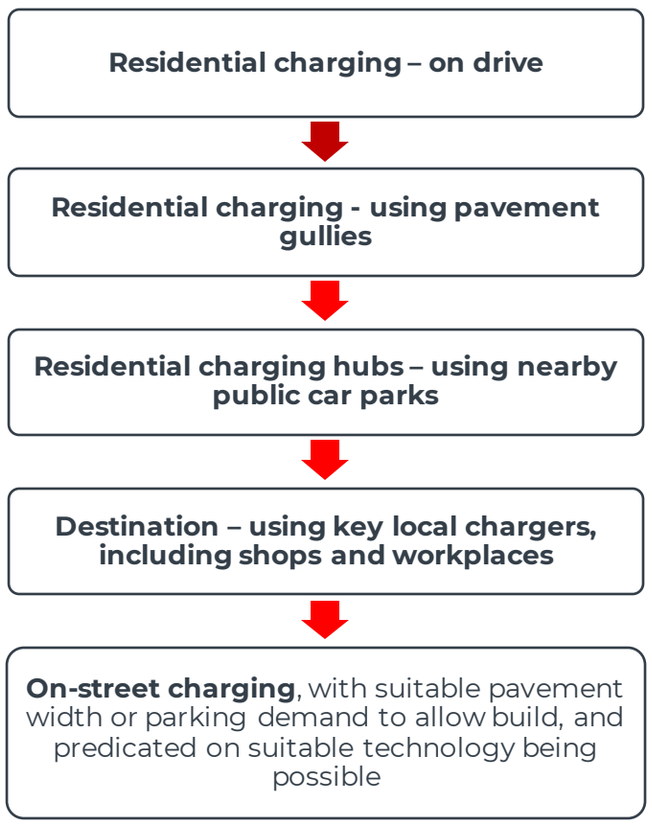
12. Work with electricity network companies to improve capacity within the network

This document summarises the engagement that has taken place with the DNO, including key constraints and issues with supply.

Recognising that grid capacity is a key risk to the delivery of suitable charging infrastructure, DCC will work with National Grid Distribution to enable better forward-planning, remove potential barriers presented by a lack of information and raise awareness of the issue.

Twelve recommendations have been identified as part of Devon's EV Strategy. These recommendations are based on a preference for how residents and visitors will charge EVs in Devon. A EVCP solution hierarchy has been developed, to identify the preferences for how EVs are charged.

Figure 40 EVCP solution preference hierarchy



Appendix

Reference List (1/2)

Accessed April – July 2022

Title	Link
BEAMA Guide to Electric Vehicle Infrastructure	https://www.beama.org.uk/resourceLibrary/beama-guide-to-electric-vehicle-infrastructure.html
Devon County Council Electric Vehicle Position Paper	https://devoncc.sharepoint.com/sites/PublicDocs/Highways/Roads/Forms/AllItems.aspx?id=%2Fsites%2FPublicDocs%2FHighways%2FRoads%2FParking%2FTraffic%20Regulation%20Orders%2FElectric%20Vehicle%20Charging%2FDCC%20EV%20Position%20Paper%5F2021%20Final%2Epdf&parent=%2Fsites%2FPublicDocs%2FHighways%2FRoads%2FParking%2FTraffic%20Regulation%20Orders%2FElectric%20Vehicle%20Charging&p=true&ga=1
Devon County Council's Electric Vehicle Survey	https://www.devon.gov.uk/news/nine-in-ten-devon-residents-surveyed-plan-to-buy-an-electric-vehicle-by-2025/
Devon Carbon Plan	https://devonclimateemergency.org.uk/devon-carbon-plan/
Devon Economics	https://www.devonomics.info/wp-content/uploads/sites/132/2018/07/Devon-districts-2016.pdf
Devon Local Transport Infrastructure Plan	https://www.devon.gov.uk/roadsandtransport/traffic-information/transport-planning/devon-and-torbay-local-transport-plan-3-2011-2026/
European Environment Agency	https://www.eea.europa.ehttps://www.peninsulatransport.org.uk/wp-content/uploads/2022/02/Peninsula-TS-Vision-009-no-consultation.pdfu/highlights/eea-report-confirms-electric-cars
Equality Act 2010	https://www.legislation.gov.uk/ukpga/2010/15/contents
Hampshire County Council EV Charging Guidance	https://www.hants.gov.uk/transport/electric-vehicles/ev-charging-guidance
Highways Act 1980	https://www.legislation.gov.uk/ukpga/1980/66
Local EV Infrastructure Fund (LEVI)	https://www.gov.uk/guidance/apply-for-local-electric-vehicle-infrastructure-levi-pilot-funding
Norfolk County Council EV Cable Permissions	https://www.norfolk.gov.uk/business/licences-and-permits/ev-cable-permission
On-Street Residential Chargepoint Scheme	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
OxGul-e	https://gul-e.co.uk/
PAS 1899 standards	https://standardsdevelopment.bsigroup.com/projects/2021-01846
Peninsula Transport Vision	http://www.peninsulatransport.org.uk/wp-content/uploads/2021/07/Peninsula-TS-Vision-008.pdf
Rapid Charging Fund (RCF)	https://www.gov.uk/guidance/rapid-charging-fund
Rural Electric Mobility Enabler	https://gtr.ukri.org/projects?ref=10005980

Reference List (2/2)

Accessed April – July 2022

Title	Link
The UK Electric Vehicle Supply Equipment Association (UK-EVSE) Procurement Guide	https://www.r-e-a.net/wp-content/uploads/2020/03/Updated-UK-EVSE-Procurement-Guide.pdf
Transport for London's Electric Vehicle Charge Point Installation Guidance	https://lruc.content.tfl.gov.uk/london-electric-vehicle-charge-point-installation-guidance-december-2019.pdf
UK Government – Decarbonising Transport	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/932122/decarbonising-transport-setting-the-challenge.pdf
UK Government - Electric Vehicle Infrastructure Strategy	https://www.gov.uk/government/publications/uk-electric-vehicle-infrastructure-strategy
UK Government – Future of Mobility Strategy	https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/846593/future-of-mobility-strategy.pdf
UK Government – Inclusive Mobility	https://www.gov.uk/government/publications/inclusive-mobility-making-transport-accessible-for-passengers-and-pedestrians
UK Government – Net Zero Strategy	https://www.gov.uk/government/publications/net-zero-strategy
UK Government – NO2 / Air Quality Plan	https://www.gov.uk/government/publications/air-quality-plan-for-nitrogen-dioxide-no2-in-uk-2017
UK Government – Office for Low Emission Vehicles Technical Specifications	https://www.gov.uk/guidance/residential-chargepoints-minimum-technical-specification
UK Government – Road to Zero Strategy	https://www.gov.uk/government/publications/net-zero-strategy
Workplace Charging Scheme (WCS)	https://www.gov.uk/guidance/workplace-charging-scheme-guidance-for-applicants
WPD	https://www.westernpower.co.uk/ https://www.westernpower.co.uk/innovation/projects/take-charge
ZapMap	https://www.zap-map.com/