Cheshire West & Chester Council

Electric Vehicle Charging Infrastructure Strategy

Consultation draft

Cheshire West and Chester

Cheshire West and Chester Council Electric Vehicle Charging Infrastructure Strategy (2023-2027)

Consultation Draft

Contents

1. Consultation Information

Cheshire West and Chester Council is developing a strategy and action plan outlining key areas of work which will help support the roll-out of charging infrastructure for electric vehicles across our borough.

We want to hear your views on the draft strategy so that we can develop and inclusive, effective and innovative plan that will help residents, businesses and other organisations transition to electric vehicles, as part of a wider movement to a decarbonised, healthier transport system.

This strategy covers the next five years but sets a framework for the Council's role into the long-term.

Share your ideas and views of the plans by completing the survey by Wednesday 15 March 2023. A summary version of this report is also available on the consultation website.

There are a number of ways you can take part:

- Complete the survey at www.cheshirewestandchester.gov.uk/EVconsultation
- Email your views to: TransportStrategy@cheshirewestandchester.gov.uk
- Telephone the Council's Contact Centre on 0300 1238 123 and quote 'Electric Vehicle Charging Infrastructure Strategy'.
- Request a copy of our consultation or survey in alternative formats, including hard copy and easy read, using the contact details above.

Paper questionnaires and written responses can be returned to the following address:

Electric Vehicle Charging Infrastructure Strategy Consultation,
Transport Planning Team, Transport & Infrastructure,
The Portal,
Wellington Road,
Ellesmere Port,
CH65 0BA.

2. Introduction

2.1. The Role of Electric Vehicle Charging Infrastructure

In 2019 Cheshire West and Chester Council voted unanimously to declare a climate emergency. The Council agreed:

- that climate change presents a threat to our way of life
- the need to act in-line with worldwide agreements on climate change and the best available evidence, which states that, to limit emissions to 1.5°C, there is a requirement to reach 'net zero' by 2045
- the Council must play its part by evidencing leadership on this issue.

The Cheshire West and Chester Climate Emergency Response Plan sets out the Council's ambitious strategy for supporting the borough to achieve the highly challenging target of carbon neutrality ("net zero") by 2045.

Transport is now the largest emitting sector across the UK, amounting to 27% of emissions in 2019, and, unlike other sectors, emissions from transport have remained relatively static over the last thirty years (see Figure 1.1/1 below).

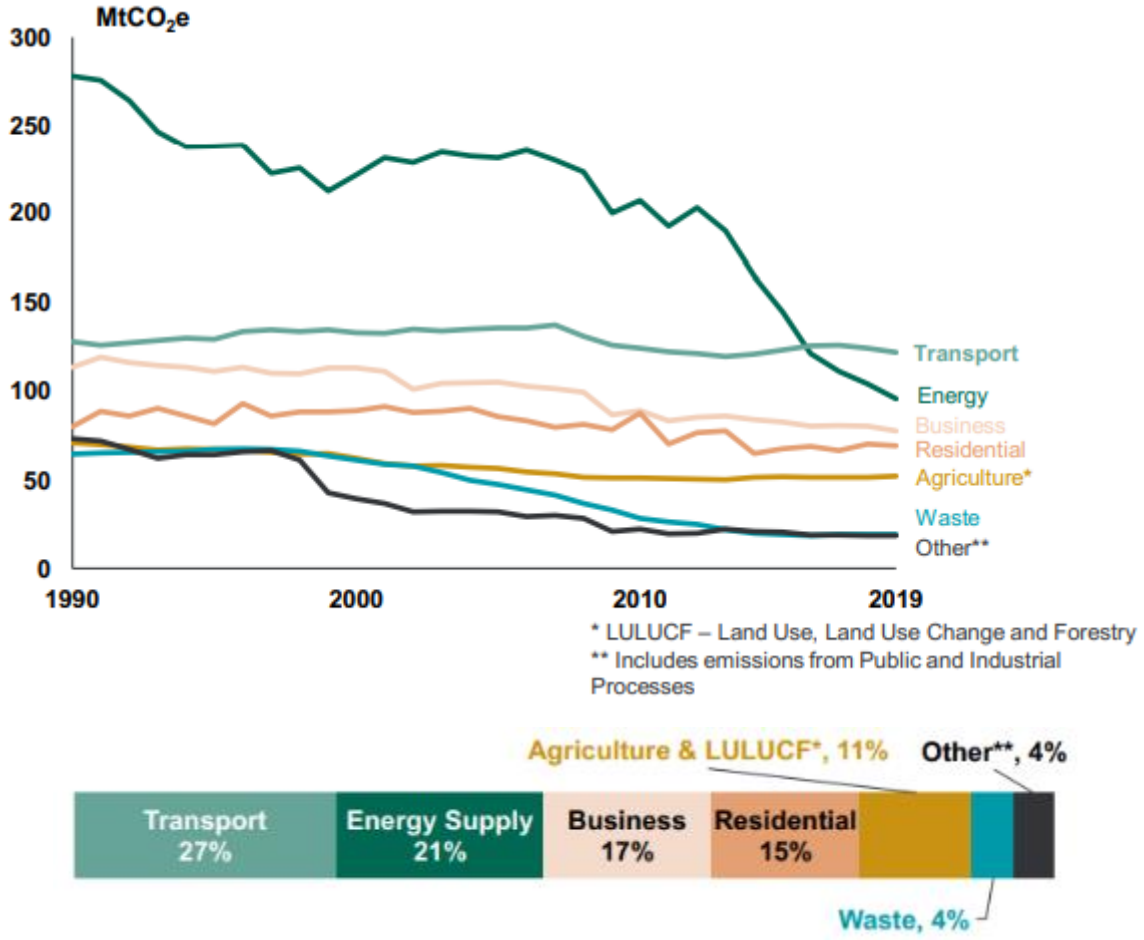

Figure 1.1/1: Greenhouse gas emissions by sector, 2019 (Source: BEIS, 2021)

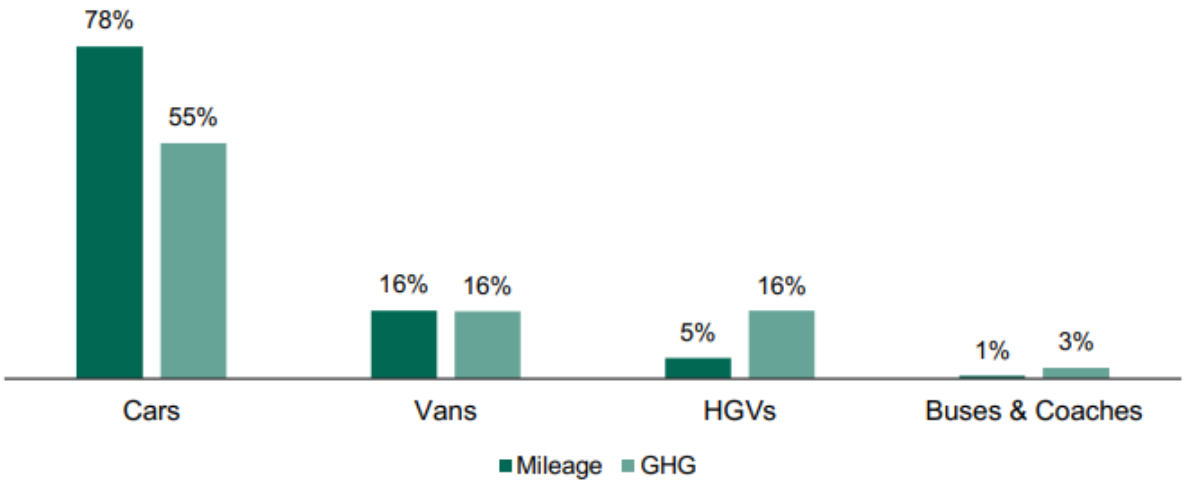

Figure 1.1/2: Emissions and Mileage for Cars, Vans, HGVs and Buses (Source, DfT, 2021)

Road emissions comprise over 90% of transport emissions and the majority of these road-based emissions arise from private cars (Figure 1.1/2). Improvements in the level of climate change gases cars emit has been largely offset by an increased number of journeys, higher car ownership and a tendency towards larger vehicles.

Car use in Cheshire West and Chester Borough is high. Before the COVID-19 pandemic, in 2019, over 2 billion miles were travelled by car or taxi in the borough[1]. Motor transport is the second-highest emitting sector within Cheshire West and Chester borough, accounting for 19% of the borough's total emissions. Road transport emissions also generate significant issues for air quality, with over half of nitrous oxide emissions in Chester City Centre caused by road traffic[2] and four areas in the borough declared as Air Quality Management Areas due to breaching air pollution limits.

The Cheshire West and Chester Climate Emergency Response Plan and Cheshire West and Chester Low Emission Strategy both set out a tiered approach to addressing this significant challenge:

- *Avoid* – by 2025, a 17% reduction in overall motorised travel demand, increasing to 25% by 2050. This is facilitated by increased digitalisation of working and key services, as well as increased walking and cycling use. This also comes with important wider strategic benefits, including improved health through reduced levels of physical inactivity and improved air quality, reduced congestion and increased footfall for local businesses[3].
- *Shift* – by 2025, a 25% reduction in car travel, increasing to 28% by 2050. Where travel is necessary, this should be via public transport. To achieve net zero, the modal share of public transport would need to increase from less than 10 per cent to 18 per cent by 2025, increasing to 29 per cent by 2050.
- *Improve* – public transport itself should be low-carbon, with the achievement of 100% low-carbon rail and 51% low-carbon buses by 2025. Where car travel is unavoidable,

[1] https://roadtraffic.dft.gov.uk/local-authorities/148

[2] low-emission-strategy-180219 (cheshirewestandchester.gov.uk)

[3] See pages 9-10: Gear change: a bold vision for cycling and walking (publishing.service.gov.uk)

cars need to be low or zero carbon, with a transition to 100% electric or hydrogen vehicles by 2050. Necessary car trips should use shared electric vehicles (e-car clubs or lift sharing) where this option is available. The transition to electric vehicles also brings wider benefits, such as improved health outcomes due to better air quality.

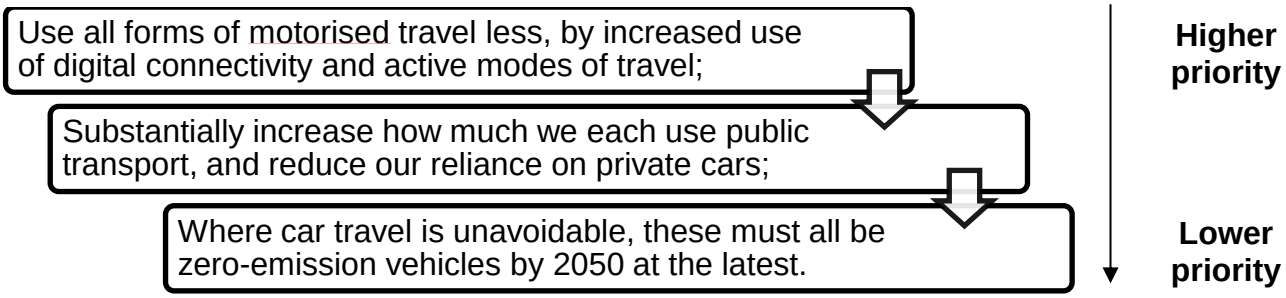

Figure 1.1/3: Avoid, Shift, Improve – Cheshire West and Chester Council's Transport Decarbonisation Hierarchy

The Cheshire West and Chester Electric Vehicle Charging Infrastructure Strategy sets out the Council's approach to supporting the transition to electric vehicles within this framework – i.e., where other travel options are unavoidable. Comprehensive, accessible, and efficient charging infrastructure is essential in enabling the rapid adoption of electric vehicles and this strategy sets out the policies and plans to realise this goal.

While the Council has an important role in driving and enabling change, achieving a net zero carbon borough is not something we can deliver in isolation. As such, this strategy also sets out how the Council will work with partners, businesses, and residents to support the transition to zero emission transport.

2.2. Terminology

In this document we use the term Electric Vehicle (EV) to refer to all 'plug-in' vehicles including pure Battery Electric Vehicles (BEVs), Plug-in Hybrid Electric Vehicles (PHEV), and Extended Range Electric Vehicles (EREVs), as all require charging to travel using their zero emissions capabilities. 'EV' here does not include hybrid vehicles without a plug.

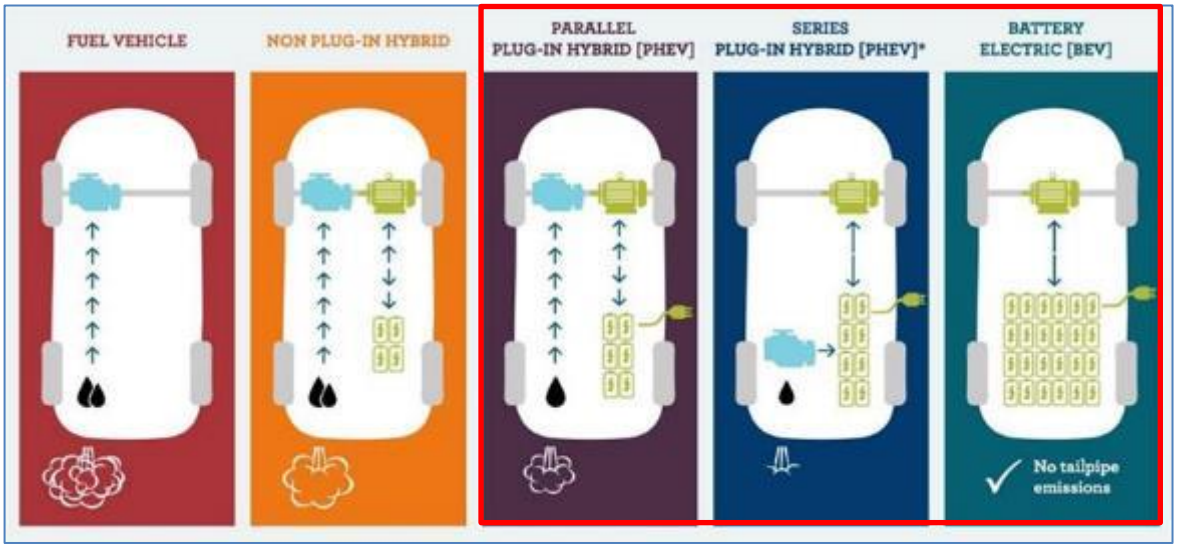

Figure 1.2/1: Vehicle Types (Source: Better NZ Trust)

In addition, in this document we refer to an EV charging unit as an EV charger. EV chargers may have one or more sockets which allow connection to an EV to charge. These sockets are referred to in this document as EV charge points. The EV charger, charge points and any ancillary infrastructure (including the parking/charging bay itself) are together termed Electric Vehicle Charging Infrastructure (EVCI).

2.3. Scope

Through our Electric Vehicle Charging Infrastructure Strategy, we identify:

- The existing national, regional and local policy framework guiding the roll-out of EVCI.
- Opportunities and challenges for EVCI in Cheshire West and Chester
- Predictions of the likely uptake of EVs across Cheshire West and Chester and consequent geospatial impact on demand for EVCI in the borough
- A framework of EVCI options for residents without access to private off-road parking.
- Opportunities to further support the decarbonisation of road transport and manage the impact of EV charging on the grid, including how the Council will work with landowners and businesses to further increase EV charging provision.
- How we will promote public EV charging infrastructure and promote uptake of EVs

The strategy will inform our operational policies and processes, to ensure that EVCI is accessible and convenient while aligning to our broader 'Avoid, Shift, Improve' hierarchy.

This strategy covers the administrative area of Cheshire West and Chester Council. It focusses on EV charging for cars, car-based vans, and taxis (hackney carriages and private hire vehicles) for four user groups with differing needs for EV charging:

- Cheshire West and Chester residents
- Local businesses, their employees, taxis, van-based logistics operations and car clubs
- Council fleet vehicles
- Visitors to Cheshire West and Chester

The strategy does not cover EV charging for buses or large goods and service vehicles, where technological solutions are still in development and charging requirements are uncertain. Similarly, charging for e-bikes, electric motorbikes and micro-mobility solutions are not included, but may be considered in a future revision.

2.4. Delivering the strategy

This strategy includes many measures which will require dedicated resourcing, funding and the collaboration of external partners to complete delivery.

While Council budgets are uncertain and under unprecedented constraint, the Council will use our best endeavours to deliver on the aspirational commitments made in this document, using existing project funding, future Government funding opportunities and partnerships with the private sector which deliver an effective and inclusive EVCI network for Cheshire West and Chester Borough with minimal impact on existing Council budgets. All timescales are indicative targets only and will often be dependent on external funding and delivery timelines outside the purview of this strategy.

3. Summary of Commitments in this Strategy

Policy EVCI-1: Delivering Electric Vehicle Charging Infrastructure as part of a holistic, inclusive, 'net zero' transport system

The Council will seek to support the roll-out of electric vehicle charging infrastructure as part of the development of a holistic, inclusive, 'net zero' transport system, using an "Avoid, Shift, Improve" hierarchy. The roll-out of electric vehicle charging infrastructure should support wider measures that reduce demand for travel and shift trips to walking, cycling and public transport, and should be delivered in a way which benefits all parts of our communities.

Policy EVCI-2: Council-led Delivery of Electric Vehicle Charging Infrastructure

The Council will seek to enable and encourage deployment of an inclusive public Electric Vehicle Charging Infrastructure network suitable to meet predicted demand in line with national targets. Where we procure the installation of new infrastructure, we will prioritise:

- Fast chargers at key destinations such as town centres, leisure centres and other key amenities, to serve destination charging and e-car clubs.
- Slow and fast chargers in residential areas with limited off-street car parking and forecast early EV demand, to cater for overnight charging demand.
- Rapid and ultra-rapid chargers in selective town centre locations, primarily designed to serve electric taxis, fleet vehicles and e-car clubs.
- Investigation of the viability of installing appropriate EVCI at Park & Ride sites across Chester, as part of a wider strategy for the future of Chester Park & Ride.

Recognising the inherent uncertainty in the exact number of charge points needed and yet the need to rapidly increase provision, we will seek to meet or exceed regional levels of public EVCI per 100,000 population by 2025 (both total number of charge points, and number of rapid/ultra-rapid chargers) and meet or exceed the same metric nationally by 2030. This metric will include Council-led and wider provision of public EVCI within our borough.

The Council will seek external funding to ensure development of a self-sustaining EV charging network which does not rely on continuing public finance support in the future and minimises the impact on existing and future Council budgets.

Procured EVCI should be capable of using the Open Charge Point Protocol (v.1.6 or above), which is promoted as the best way to provide the widely available and accessible recharging networks of the future. This would improve functionality, reduce maintenance costs, and also allow an easier transfer of assets into any new charge operators platform if a change of supplier is required in the future.

Policy EVCI-3: Home Charging for Properties Without Off-Road Parking

Recognising that a lack of off-road parking may be a significant barrier to EV take-up, the Council will promote a hierarchy of solutions to EV charging for residents, businesses, and shared vehicles without access to off-road parking, which prioritises off-street charging hubs within a 400-metre walking distance (approx. 5-minute walk), followed by other low-impact solutions which avoid, as far as possible, generating

additional street clutter and maintenance/ management challenges.

The Council will continue to develop our customer service process for the management and recording of requests for on-street EV charging to inform future deployment of EV charging hubs and on-street EV charging.

Policy EVCI-4: Electric Vehicle Charging Infrastructure for Staff, Partners, and Fleet

The Council will support staff and visitors to access electric vehicle charging at Council premises in line with the 'Avoid, Shift, Improve' approach as reflected in the Council's Business Travel policies. We will monitor demand for staff and contractor EV charging and seek options to provide access to charging infrastructure where necessary. We will develop staff EV charging policies to set out how staff and fleet EVCI should be used.

Where technology allows, the Council will seek to transition its fleet to Ultra-Low Emission Vehicles, in line with our target to achieve net zero carbon operations by 2030. To achieve this, we will progress a systematic Fleet Review to inform the electrification of the Council's own vehicles, including exploring innovative options to support EV charging at depot sites, office car parks and at select on-street locations. We will explore opportunities to combine procurement, installation and siting of fleet, workplace and public charge point infrastructure where this is practical, safe, and feasible.

Policy EVCI-5: Electric Vehicle Charging Infrastructure in Broader Policy

The Council will seek to include statements and policies supportive of EV charging infrastructure and, where appropriate, references to this Electric Vehicle Charging Infrastructure Strategy in future revisions of Council-published standards and guidance, including the Local Plan, the Local Transport Plan and development management standards.

Policy EVCI-6: Electric Vehicle Charging Infrastructure in New Developments

All relevant developments and renovations must deliver EVCI which meets at least national minimum Building Regulations standards from June 2023, as set out in "Approved Document S".

We will explore the case for a future update of the Council's adopted Parking Standards and broader development management guidance to align with national requirements and better reflect the Council's strategic approach to transport in new developments.

For the avoidance of doubt, these requirements will apply equally to developments where the Council and its partners are acting as site promotor or developer.

In line with EVCI-1, it is not considered that the provision of EVCI will be a valid justification for additional parking spaces within a new development proposal than would otherwise be included.

Policy EVCI-7: Using the Council's Broader Influence

The Council will seek opportunities to encourage organisations, businesses and other owners of commercial public and customer car parks, including managers of housing stock and workplaces, to deploy public EV charging infrastructure where appropriate,

outside the development management process. This includes working with Council-owned companies such as Brio to manage EVCI roll-out on their sites where viable. Where possible, these sites have the potential to provide benefits for local residents at times of low commercial demand, such as overnight charging.

The Council will promote and support efforts to improve the availability of rapid and ultra-rapid EV charging on and near the strategic road network and important link roads across the borough, where appropriate and in line with local and national planning policy.

The Council will use our existing online presence to signpost information which seeks to dispel myths about EVs and promote the potential benefits of EV transition as part of a wider sustainable mobility framework.

Policy EVCI-8: Monitoring

The Council will establish and undertake a systematic process of monitoring utilisation rates and tariffs across EVCI within the borough, including liaison with the commercial sector, to explore potential for increased coordination and determine the optimum time to bring forward further EVCI. As EV uptake increases, monitoring usage will also allow us to provide additional charge points at or near sites of particularly high demand to reduce risks associated with drivers queuing to charge their vehicles.

Policy EVCI-9: Procurement

The Council will undertake systematic market engagement to determine the best methodology for procurement of one or more supply partners, with a view of adopting a holistic 'strategic sourcing' approach to provision of a full array of EVCI types across the borough – including public, fleet and workplace charging.

Policy EVCI-10: Smart Charging, Renewable Generation and Energy Storage

The Council will seek to increase the emissions reduction benefits of electric vehicles and mitigate the impact of EVCI on the local and national grid by encouraging and promoting the use of renewable energy for EV charging, encourage 'off-peak' use of EV chargers, and exploring technical options to manage grid demand from EV charging infrastructure. This will include encouraging, where appropriate, the consideration of on-site renewable generation and storage infrastructure and setting parking policies which encourage the use of EVCI in Council car parks at 'off-peak' times.

Policy EVCI-11: Engagement with the Distributor Network Operator

Noting that the provision of cost-effective power connections will be fundamental to the delivery of charging infrastructure, the Council will continually engage and work in partnership with Scottish Power Energy Networks to address key points of weakness in the power network holding back the delivery of key EVCI programmes promoted by the Council and its strategic partners.

Policy EVCI-12: Situating Electric Vehicle Charging Infrastructure

Cheshire West and Chester Council will only support or procure installation of EVCI which:

- Do not obstruct pavements, cycleways or highways, or present a safety risk to any road users, particularly vulnerable road users.
- Do not require trailing cables across the pavement unless adaptive infrastructure is provided, and no trip hazard is created.
- Do not disrupt traffic flow, including cyclists, and do not impede pedestrian movements.
- Do not introduce additional car parking where parking spaces are not currently provided or allowed.
- Avoid the creation of additional unnecessary street clutter.
- Comply with local and national planning policy.
- Meet national accessibility standards and guidelines, particularly working towards compliance with BSI PAS 1889:2022 Electric Vehicles Accessible Charging.

The planning of all installations will fully consider liabilities, planning consents, road safety implications, positioning, management and accessibility requirements in line with the latest technical standards and national best practice.

Wherever appropriate, we will use EVCI installations as an opportunity to collocate multimodal facilities, such as cycle parking and bus stop infrastructure. As part of the development of our forthcoming Local Transport Plan, we will consider the case for development of a Kerbside Policy for key urban areas, setting out a strategic approach of managing kerbside highway uses including EV charging, parking, and quality public space.

4. Policy Context

4.1. European Union (EU) Policy

Although the United Kingdom (UK) has left the EU, there are many vehicle manufacturers based in Europe that are governed by EU policy and regulations. Models made in the UK are sold across Europe and therefore the requirements of the EU in terms of vehicle specifications and decarbonisation indirectly affect the UK market.

The EU's Directive for Alternative Fuels Infrastructure requires governments to adopt national policy frameworks for EV infrastructure roll-out. The UK Government has also committed to achieving at least these goals following its departure from the EU. Grammes of Carbon Dioxide (CO_2) per kilometre (km) driven is the primary measure used by the EU to enforce improvements in new car and van fleet emissions, and vehicle manufacturers can be fined based on their average new car sales emissions. The current maximum threshold for new car sales is 95g CO_2/ km. The EU recently announced even tighter targets for new cars and vans to be achieved by 2030 through its Clean Mobility package. The UK Government has also committed to achieving these goals as a minimum following the departure from the EU.

4.2. National

During November 2020, the UK Government made announcements on new domestic (UK) policy with reference to the climate change challenge. These announcements also fed into the UK's hosting of the 26th United Nations Climate Change Conference of the Parties (COP26) in Glasgow in November 2021. For the first time, Ministers, and representatives from some of the world's largest and most progressive car markets have come together to form a new Zero Emission Vehicle Transition Council. A joint statement was released stating that road emissions currently account for over 10% of global greenhouse gas emissions, and emissions are continuing to rise. Therefore, the rapid transition to zero emission vehicles is vital to meeting the goals of the climate Paris Agreement. The globe is currently not on track and the pace of transition needs to dramatically increase. In addition to greenhouse gas emission reductions, this transition will generate job and growth opportunities, improve air quality, improve public health, boost energy security, and assist in balancing electricity grids during the transition to clean power.

The Climate Change Commission's (CCC's) Sixth Carbon Budget (2020) sets the limit on allowed UK territorial greenhouse gas emissions over the period 2033 to 2037. Under the Balanced Net Zero Pathway, options to reduce emissions, including take-up of zero-emission technologies and reduction in travel demand, combine to reduce surface transport emissions by around 70% by 2035 (Figure 3.2/1).

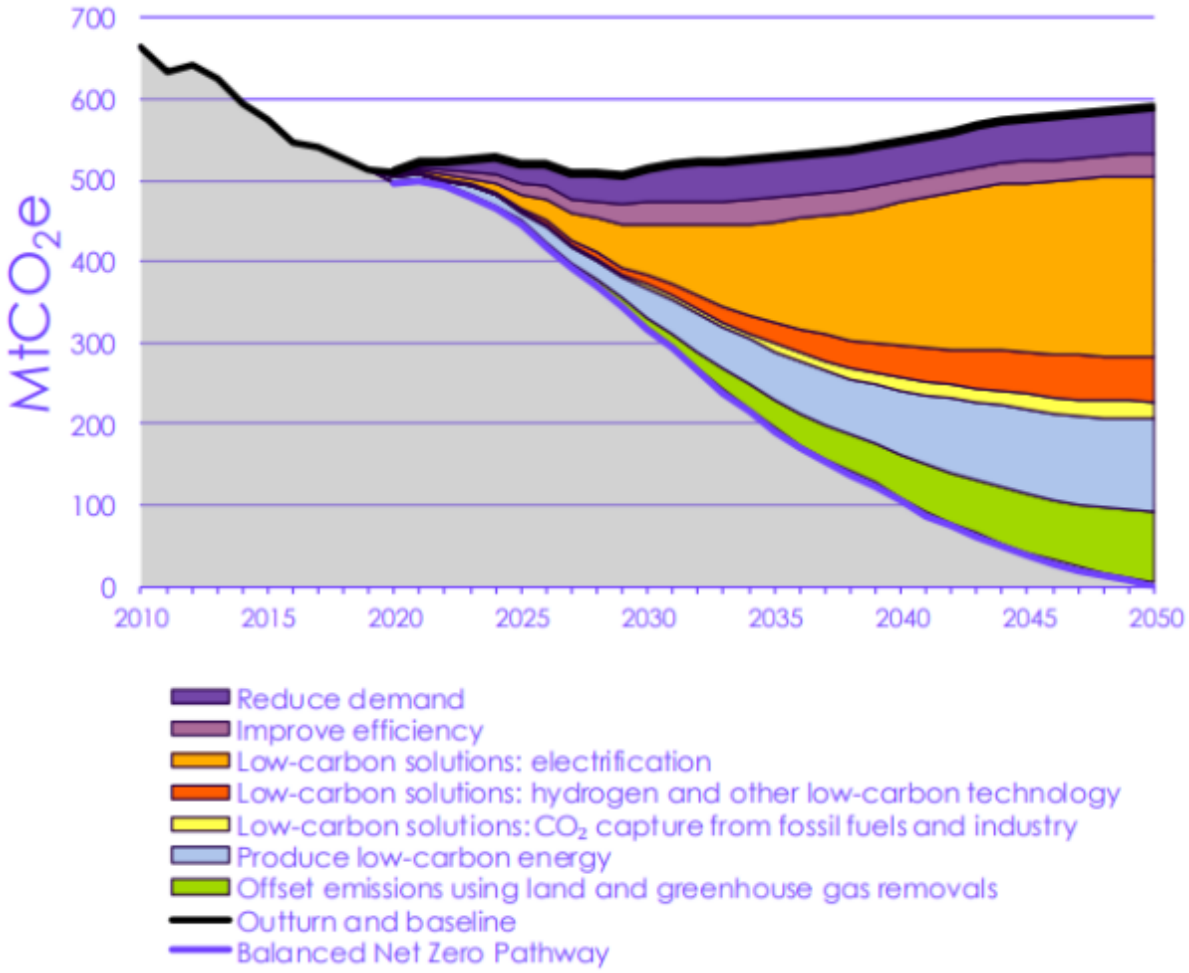

Figure 3.2/1: Sixth Carbon Budget – Types of Abatement in the Balanced Net Zero Pathway (Source: Committee on Climate Change, 2020)

The Department for Transport's Decarbonising Transport Plan (2021) recognises that transport is the largest contributor to UK domestic greenhouse gas emissions, and that most of these emissions come from passenger cars. It notes that domestic greenhouse gas emissions from transport have been broadly flat over the last 30 years, even as those of other sectors have declined. In fact, the UK's transport sector has made the least contribution to a reduction in emissions to date (~5%[4]), making it a prime target for future regulation. It confirms the Government's plan to end the sale of polluting road vehicles by 2030, with all new cars and van sold to be fully zero emission at the tailpipe from 2035 and sets an ambition to phase out all new non-zero emission road vehicles by 2040, from motorbikes to HGVs. However, it also notes that a transition to zero emission cars and lorries alone will not be sufficient to meet national climate goals, nor address other harms such as congestion or road danger, and that increasing car occupancy and the share of trips taken by public transport, cycling and walking is therefore also critical. The UK Net Zero Strategy (2021) echoes this message, and states that future Local Transport Plans produced by local authorities will need to demonstrate how local areas will deliver

[4] Department for Transport (2021) https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/984685/transport-and-environment-statistics-2021.pdf

quantifiable carbon reductions in line with net zero targets. This confirms the approach set out in the Government's Ten Point Plan for a Green Industrial Revolution (2020)

The National Electric Vehicle Charging Infrastructure Strategy "Taking Charge" (2022) sets out a plan to remove charging infrastructure as both a perceived and a real barrier to the adoption of electric vehicles. It recognises that predictions of the future mix and number of charge points is uncertain but aims to make EV charging cheaper and more convenient than refuelling at a petrol station. It states that there should be around 300,000 public charge points as a minimum in the UK by 2030 "but there could potentially be more than double that number". It sets out plans for a £950m Rapid Charging Fund to support the rollout of at least 6,000 across England's motorways and major A-roads by 2035, and a further £500m to support local authorities to plan and deliver public EVCI.

Following a consultation in Summer 2019, the government has made changes to the English Building Regulations regarding EV charging provision in new developments, setting a new national minimum acceptable standard for new developments in Approved Document S. The Approved Document took effect on 15th June 2022 and applies to any applications submitted since that date, or before if work starts on site before 15th June 2023.

In 2021, the Office of Zero Emission Vehicles (OZEV) consulted on the prospect of providing government with the power to mandate Local Authorities, Charge Point Operators, or Landowners to have a statutory obligation to plan and provide infrastructure and improve the experience for EVCI consumers. A response to the consultation is awaited.

National Grid's Future Energy Pathway Scenarios (2021) sets out a framework for rapidly transforming the existing energy system to deliver reliability and value for consumers while achieving net zero emissions by 2050.

The Department for Environment, Food and Rural Affairs' (DEFRA) Clean Air Strategy (2019) – sets out the Government's plan to tackle all sources of air pollution, making our air healthier to breathe, protecting nature and boosting the economy, including supporting a move towards mass adoption of EVs.

4.3. Regional

Transport for the North (TfN) are the England's first sub-national transport body, a partnership of local authorities, business leaders and transport operators, coordinating and lobbying for the transport infrastructure needed to drive transformational economic growth. Their *Strategic Transport Plan (2019)* outlines a robust case for transformational transport investment across the North, including a rapid increase in the number of public charging points across all areas of the North to ensure that EV drivers can easily locate and access EV charging infrastructure that is affordable, efficient, and reliable. Building on this, their *Transport Decarbonisation Strategy (2021)* sets out how TfN and partners across the North are committing to a regional near-zero carbon surface transport network by 2045. This supports TfN's key aims for improving localised air quality, which are:

- A 55% reduction in emissions from 2018 to 2030, achieved mostly through mode-shift and demand reduction, and
- A 95% reduction in emissions from 2018 to 2040, reflecting longer-term decarbonisation measures, such as a high proportion of zero emission vehicles in the vehicle fleet.

The Cheshire and Warrington Local Enterprise Partnership is a regional partnership between private, public, and voluntary sectors which sets the strategic direction for the

economic development of Cheshire and Warrington. Their Transport Strategy (2018) sets out the transport and connectivity improvements central to the region's aspirations for growth and economic development. It notes the need to embrace and embed new technologies such as electric vehicles as part of holistic, efficient transport systems. The Cheshire & Warrington Energy and Clean Growth Strategy (2018) sets out the energy challenges facing the sub-region, and how to meet the challenge of delivering 'affordable energy and clean growth'. The strategy notes that the Cheshire and Warrington Local Enterprise Partnership (LEP) has a role in promoting low carbon technologies and making new development sustainable, including promoting EV charging infrastructure. The Cheshire and Warrington Sustainable and Inclusive Growth Commission's Sustainable and Inclusive Growth Strategy (2022) sets out plans for how to improve the inclusiveness of the regional economy, decarbonise local transport, use land sustainable and achieve net zero. It sets out a priority for creating an ecosystem which makes the adoption of electric or zero emission vehicles the most cost effective and accessible means of motorised transport where public transport is not appropriate or available by 2030, including the key role of the public sector in facilitating the roll-out of public charging devices.

4.4. Local

The Cheshire West and Chester Council Plan 2020-2024 sets out a vision for building greener, fairer, stronger communities across the borough. The Council has made two key emergency declarations: a climate emergency, with a requirement to achieve a net zero carbon borough by 2045, and a poverty emergency, which aims to drive a significant reduction in the number of people in the borough experiencing poverty and financial hardship. In delivering against these declarations, the Council's Climate Emergency Response Plan (2020) sets out commitments to work with partners to increase the number of publicly available EV charging points, ensure that new builds include EV charging points, and review potential for provision of electric buses in future. The Fairer Future Strategy (2022) identifies transport as a significant barrier that keeps people trapped in poverty and supports urgent action to achieve affordable and sustainable transport to remove the barriers people face accessing jobs and key services.

The Cheshire West and Chester Council Low Emission Strategy (2018) highlights the significant problems caused by air pollution, and the particular contribution transport makes to these emissions. The strategy aims to incentivise the replacement of diesel vehicles with EVs, whilst emphasising the importance of establishing a network of charging infrastructure to facilitate the transition. The Chester Air Quality Action Plan (2022) proposes a series of actions to be taken to improve the quality of Chester's air, including promoting sustainable modes of transport and modal shift away from private vehicle use, accelerating the uptake of EV taxis, exploring parking incentives which promote the uptake of EVs, and accelerating the widespread implementation of public EVCI for private vehicles, taxis, and van-based fleets.

The Council's Local Transport Plan (2017-2030) sets outs the Council's overarching strategy and objectives for improving local transport in the borough. The plan identifies the importance of prioritising EV uptake to address air pollution problems and commits to pursuing external funding to support the building of additional EV charge points. Development of a new Local Transport Plan is currently underway, and will focus on the challenge of achieving fairer, greener transport.

The Cheshire West and Chester Local Plan Part Two (2019) sets out the requirement for new developments to seek to maximise the use of sustainable (low carbon) modes of

transport by incorporating high quality facilities for pedestrians, cyclists, and public transport and, where appropriate, charging points for electric vehicles. The Council's Parking Standards Supplementary Planning Document (SPD) (2022) reiterates this requirement, including passive provision for future EVCI installations and a recommended standard of the provision of EV charging infrastructure in developments with 10 or more new car parking spaces, including one dedicated EV charging point per 10 flats, 30 staff parking bays or 1,000m^2 commercial floorspace.

The Cheshire West and Chester Bus Service Improvement Plan (2021) recognises the need for a partnership approach to setting minimum emissions standards for the bus fleet in the borough, and the need to invest in charging/ fuelling infrastructure to enable deployment of zero-emission vehicles across the network.

4.5. Stakeholder Feedback

Experience has shown that stakeholder engagement and feedback is a crucial component to obtaining local knowledge for the region's EV uptake trends. A workshop was undertaken in July 2021 with Council officers, Jacobs Consulting and Zero Carbon Futures. The key themes identified as part of this workshop are summarised below:

- The supply of vehicles is currently constraining uptake, rather than a lack of EVCI. Notable expansions are planned in the UK, including Vauxhall at Ellesmere Port.
- It is critical that the transition to electric vehicles is part of a multi-modal strategy and does not lead to electric vehicle trips replacing public transport and active travel trips.
- Consider upskilling, training, and capacity of the supply chain in delivering EVCI
- Continuous engagement with the Distribution Network Operator is essential to ensure that there is sufficient capacity available to install EVCI in areas of high demand.
- Balancing the need for revenue generation against social inclusion.
- Considering how and where on-street parking provision could be provided.
- Promoting EV uptake via car clubs, taxis, buses, community transport operators and through electrification of the Council's fleet; and
- Working with the private sector to fund the roll-out of EVCI.

Particular local opportunities identified included:

- Reviewing the potential for Chester Park and Ride sites to become multi-modal hubs/ interchanges, combining public bus services serving Chester and on-route charging behaviours.
- Reviewing and recommending standards that can potentially be included in future Supplementary Planning Documents (or similar) for residential/ commercial developments.
- Exploring whether solar power can be utilised to supply charging infrastructure, which would reduce the pressure on the grid; and
- Investigating whether the Council can partner with commercial operators to offset capital cost and agree revenue shares for each site.
- Facilitating a shift of 'final mile' deliveries from non-electric vehicles to e-bikes/ scooters

through the provision of hubs to improve air quality in urban areas.

- Procuring EVCI so that users interact with the same interface and/ or mobile application to reduce complexity and improve EV uptake. This would also include the creation of an ‘easy to use’ registration scheme to build a reliable database.
- Potentially reducing the cost of noise mitigation at new developments because EVs are much quieter than conventional vehicles.
- Promoting existing applications that allow residents with off-street parking to offer their charger to EV drivers who live in dwellings with limited off-street parking provision; and
- Encouraging employers to provide EV purchasing/ car leasing schemes as a benefit to employees to promote uptake.

5. Strategic Aims and Objectives

Building on this policy background, the Council's aim for the Cheshire West and Chester Electric Vehicle Charging Infrastructure Strategy is:

- To provide a sustainable EV charging infrastructure network that supports journeys across the borough, is easy to use, intuitive and integrated, is inclusive and accessible for all, and offers good value for money, both for the Council and network users.
- To contribute to a broader 'net zero' transport network which supports the Council's decarbonisation and air quality objectives, delivering healthier communities while supporting inclusive economic growth. This requires significant reductions in reliance on private cars, along with shift to making trips on foot, by bike and via public transport.

The Cheshire West and Chester Electric Vehicle Charging Infrastructure Strategy provides an operational approach to enabling and deploying charging infrastructure in our borough. In the short-term, our objectives are to:

- Enable and deliver a comprehensive public EVCI network across Cheshire West and Chester borough, including through our ability to influence and leverage investment from the private sector and other partners.
- Set out our approach to managing EV charging in Council car parks, and to ensuring that residents without access to private off-road parking can access appropriate EVCI.
- Encourage new developments to include high quality EV charging infrastructure

This strategy uses a data-driven approach to understand how the Council can invest sustainably in the existing network. This will enable investments in new charging infrastructure to be made in a timely way to provide a high-quality charging network that offers value for money across the lifespan of charge points.

5.1. Social inclusion

As well as its 2019 Climate Emergency Declaration, Cheshire West and Chester Council has also declared a Poverty Emergency, providing a framework for a fairer, greener recovery following the Covid-19 pandemic. There are significant communities of deprivation across the borough, with over 24,000 residents living in neighbourhoods that rank in the 10% most-deprived neighbourhoods in England. Two of these neighbourhoods, areas, in Lache and Winsford, are in the two per cent most deprived areas in England. Highest levels of deprivation are concentrated within urban areas, in the city of Chester and towns of Ellesmere Port, Northwich and Winsford although dispersed rural poverty is also a challenge.[5] Ellesmere Port has also been identified by TfN as one of the places across the North of England with the greatest risk of Transport-Related Social Exclusion. These are areas which face a combination of poor access to key destinations by public transport and active travel, and high vulnerability to social exclusion based on local economic conditions, the demographics of the population, and multiple forms of deprivation[6].

As an emerging technology with significant constraints on market supply, EVs currently cost significantly more than internal combustion engine vehicles to purchase new, and

[5] The Poverty Emergency | Cheshire West and Chester Council

[6] TFN_SociallyInclusive_Draft-for-consultation.pdf (transportforthenorth.com)

there is a very limited second-hand market. As such, there is currently an established link between income levels and the uptake of EVs. Price parity is not expected to be reached until the mid-to-late 2020s and is reliant on the falling price of batteries and an increasing supply of EVs. As such, it is expected that the correlation between areas of affluence and early mass adoption of EVs will continue into the medium term.

Nonetheless, lower income households are often disproportionately affected by poor air quality and are typically more vulnerable to the impacts of climate change. While deprived communities may not be early mass adopters of EVs, they may be significant beneficiaries of a move away from polluting modes of transport. However, it is critical that the transition to EVs does not 'lock in' car dependency by coming at the expense of promoting travel reduction, active transport, and public transport options.

While the Council is limited in the actions it can take to support low-income households with the purchase of EVs, action can be taken to ensure equitable access to EVCI. Car club vehicles may also provide a more affordable alternative to private EV ownership for occasional use, with the potential to give wider access to clean vehicles, and support reductions in private vehicle ownership. Electric car clubs and the charge points needed to power them are therefore included as a valuable measure to improve social inclusion in Cheshire West's EV ready future. Depending on use patterns and access arrangements, car clubs can also provide a more convenient and affordable means of ensuring access to a car when needed, while avoiding the cost of owning or leasing a vehicle.

Policy EVCI-1:	**Electric Vehicle Charging Infrastructure as part of a holistic, inclusive, 'net zero' transport system**
The Council will seek to support the roll-out of electric vehicle charging infrastructure as part of the development of a holistic, inclusive, 'net zero' transport system, using an "Avoid, Shift, Improve" hierarchy. The roll-out of electric vehicle infrastructure should support wider measures that reduce demand for travel and shift trips to walking, cycling and public transport, and should be delivered in a way which benefits all parts of our communities.	

6. Technological Background

6.1. Electric Vehicle Trends and Technologies

EVs are currently the only mature technology offering a workable alternative to Internal Combustion Engine (ICE) vehicles. However, uptake in the UK is still at the early adopter stage. Generally, uptake is led by relatively affluent, and environmentally conscious, buyers who are keen to:

- Adopt new technologies.
- Reduce their personal transport impacts; or
- Purchase an EV for tax reasons/ company policy.

Early research shows that EV consumers prefer to charge at home overnight or at work during the day, which suggests a low current demand for public recharging services. Most early EV adopters have off-street parking enabling them to charge at home overnight, although this capability is greatly curtailed in some residential areas.

As of early 2023, there are 151 BEV models available on the UK market. The second-hand EV market is still small, comprising just over 3% of the used car market in 2021[7].

Battery Capacities and Capabilities

The amount of charge a charge point can deliver is limited by the charging capability of the car itself. Prior to 2016, most EVs charged at 3 kW AC, called slow charging, which was adequate to fully recharge most batteries overnight. While technology has moved on, only some models produced prior to 2016 are capable of rapid charging.

Analysis of the EV vehicles on the market shows that battery capacity is growing. However, there will be lower capacity batteries within the fleet from models sold in previous years that consequently have lower mileage ranges, particularly in the second-hand market. Whilst this will affect the average range of current BEVs, it will become less of a concern as the existing fleet grows because more recent models have longer ranges.

Battery Size	Number of Vehicles	Typical Range
Up to 40 kWh	10	Up to 160 miles
40 to 50 kWh	23	160 - 200 miles
50 to 70 kWh	30	200 - 280 miles
70 to 90 kWh	70	280 - 365 miles
90 to 100 kWh	7	365 - 400 miles
100 kWh+	11	400 - 500 miles

Figure 5.1/1: Distribution of vehicles along the battery range

[7] https://www.rac.co.uk/drive/news/electric-vehicles-news/record-year-for-second-hand-ev-sales-as-used-car-market-grows/

Hydrogen Vehicles

Hydrogen vehicles offer a potential future alternative to plug-in electric vehicles. Hydrogen fuel cell vehicles are powered by electricity they produce internally through chemical reactions between hydrogen and oxygen. The only exhaust emissions from hydrogen fuel cell vehicles is water. Similarly to plug-in EVs, the overall carbon impacts of these vehicles are predominantly linked to the decarbonisation of fuel production.

There are also combustion hydrogen systems using a conventional engine. However, these still produce nitrogen oxide (NOx) and CO^2 exhaust emissions, and are therefore not zero emission vehicles

The 2021 UK Hydrogen Strategy[8] sets out the government's view of what needs to happen to enable the production, distribution, storage and use of hydrogen across a number of different sectors. It notes that hydrogen is likely to be fundamental in achieving decarbonised transport by complementing electrification. However, its use is likely to be focused initially on heavier forms of transport that might be unsuitable for standard electric vehicle systems, particularly for buses, heavy goods vehicles, shipping and aviation. These vehicles are outside the scope of this strategy and in no way reduce the urgent demand for new electric vehicle charging infrastructure. Battery electric technology is anticipated to remain the majority route for cars and vans over the coming decades at least, and this is reflected in investment plans from car manufacturers as well as rising uptake of EVs amongst motorists.

6.2. Electric Vehicle Charging Technologies

Types of Charge Point

There are many specifications of charge point in the market, differentiated by power output, communication protocol, type, and number of charging outlets (see Figure 5.2/1). Each have factors which make them suitable for different charging settings and use cases. Slow and fast chargers suit home/ destination charging patterns, where the driver looks to recharge at a location that they will be leaving the car for a considerable amount of time. Rapid and high-power chargers suit on-route charging, quick recharging at destinations, and support the taxi trade due to their high-speed capabilities.

Charge Point Types	Power Output (kW)	Current/ Supply Type	Socket/ Plugs	Charging Duration (40kW battery)	Use Cases
Slow	<7	AC	Type 2 Socket	13 hours	Home/ Destination
Fast	7 – 22	AC	Type 2 Socket	2 to 5 hours	Destination
Rapid	43 -50	AC	AC – Type 2		On-route

8 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1011283/UK-Hydrogen-Strategy_web.pdf

		DC	DC – CHAdeMO	30 minutes to 80%	
		DC	DC – CCS Captive cables with plugs attached		
Ultra-rapid	100 +	DC	Tesla 120kW	Varies depending upon vehicle	On-route
		DC	CCS 150kW+		

Figure 5.2/1: Charging Point Types

Smart Charging

Regular charging commences as soon as the EV is plugged in, drawing the maximum amount of power available from the supply until the battery is fully charged. For large fleets, this could overload the available power supply causing practical power outages on-site, as well as financial penalties from the energy supplier. Alternatively, smart charging allows the monitoring and management of the charging session. The session can be managed remotely and control when, for how long, and how rapidly, the EV recharges.

There are currently three levels of smart charging available:

- Basic load balancing distributes the available power capacity equally between all charge points to prevent overloading and high energy costs at peak times.
- Scheduled/ static load balancing can also optimise charging schedules to take financial benefit from time of use energy tariffs.
- Dynamic load balancing can combine both static and dynamic data such as bus routes, next day plans and dynamic energy pricing. This ensures that the entire fleet is charged in time for individual departure at the lowest cost.

Wireless Charging

Various national companies and national Governments across the world are trialling methods of wireless charging, attempting to iron out the questions raised on the topic such as retrofitting costs, whether infrastructure should be built if supply is not sufficient and vice versa, and the international standards needed for wireless charging to go global. Existing vehicle models do not include this technology and therefore there is not an immediate requirement for this infrastructure.

6.3. Opportunities and Challenges for EV charging

EVs and the infrastructure needed to support them present a series of challenges and opportunities. Figure 5.3/1 summarises the factors considered in developing this Strategy.

Opportunities	Challenges
• Encouraging drivers to switch from petrol/diesel to EV will benefit local air quality and decarbonise transport as energy generation progresses from fossil fuels to renewable sources. • Chargers may attract EV users to an area and stimulate nearby shops and the local economy • Charge Point Operators (CPOs) offer concession contracts for chargers at little or no cost to local authorities and which may provide a revenue opportunity in the future. • The Council owns car parks located in urban centres close to both businesses and residential properties which have limited off-road parking. • The Council has control of highways land assets on major roads which could provide opportunities for rapid charging stops. • On-street charging infrastructure may offer locations for users to charge where there is no off-road alternative. • In the longer-term, as EV adoption accelerates, chargers could offer a new revenue stream for Councils	• Available power capacity on the electricity network varies across the borough and is limited in some areas, including key urban settlements. Upgrade costs are often high. • Access to working public EV charging is a key concern for EV drivers. • Instant access to EV charging networks often requires use of apps, roaming across charger networks is limited. • Owning and operating chargers and management of contracts generate costs for Councils while funding is constrained. • The business case for CPOs remains challenging whilst demand for EVs is still growing and some operators may not want to operate in low-use settings. • Nationally, approximately 25% of households have no access to home EV charging as they park on the street. • On-street chargers require space on the public highway. Some locations may present an obstruction to pedestrians. • On-street parking bays are limited in certain areas. Reserving bays for EV users may increase pressure on parking and require resources for the traffic order. • Risk of engraining car-dependency and undermining modal shift

Figure 5.3/1 - Opportunities and challenges for developing a public EV charging network

7. Existing Demand and Supply

7.1. EV uptake in Cheshire West and Chester

To support the drive to reach net zero carbon emissions by 2050, the UK government has set out its ambitions to end the sale of new petrol and diesel cars by 2030, bringing the end date forward by 10 years from that proposed in the Road to Zero.

EV ownership in Cheshire West and Chester is growing steadily, in line with global trends. Figure 6.1/1 shows the growth between 2009 Q4 and 2022 Q2 in the proportion of EVs in the wider Cheshire West and Chester vehicle fleet compared to:

- Cheshire East
- Warrington
- Merseyside
- York
- Oxford

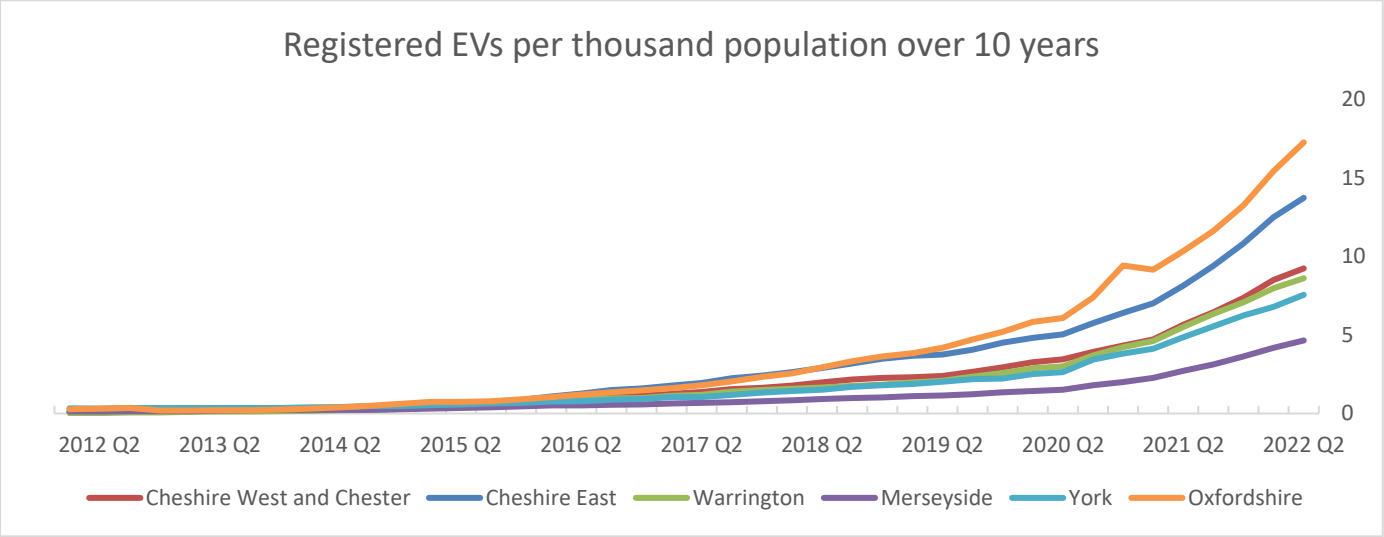

Figure 6.1/1: Registered EVs per 1000 population (2012 – 2022) (Source: ONS)

7.2. Current EV charging provision

Figure 6.2/1 illustrates the current distribution of EVCI charge points across the UK.

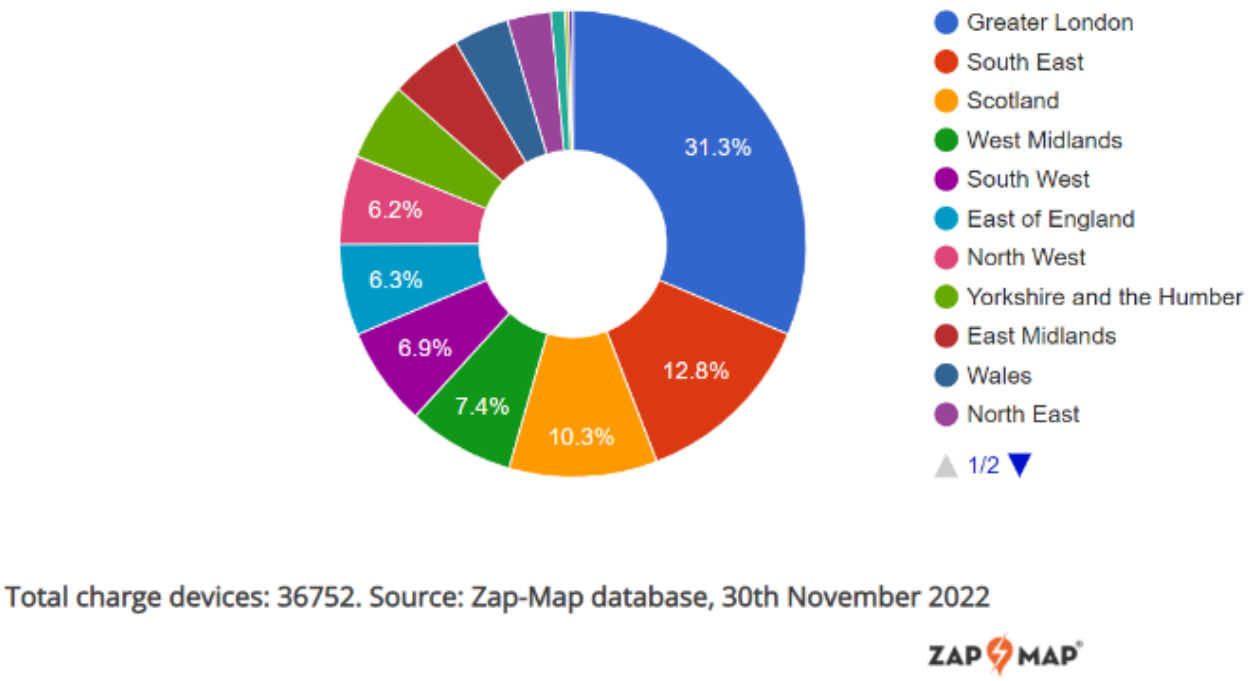

Figure 6.2/1: Total Connectors by Region (Source: Zap-Map 2022)

Public EV charging infrastructure in Cheshire West and Chester is currently limited and patchy, with most centred in urban areas and little provision in smaller market towns or more rural areas. The latest national data suggests there are currently 176 public chargers within Cheshire West and Chester borough, divided by speed as set out in Figure 6.2/2. Figure 6.2/3 and Figure 6.2/4 demonstrate how this compares with regional and national averages across the UK.

Charger speed	Number of sites	Number of charge points
Ultra-Rapid	2	4
Rapid	12	35
Fast	33	136
Slow	1	1
Total	**48**	**176**

Figure 6.2/2: Public EV chargers in Cheshire West and Chester by speed

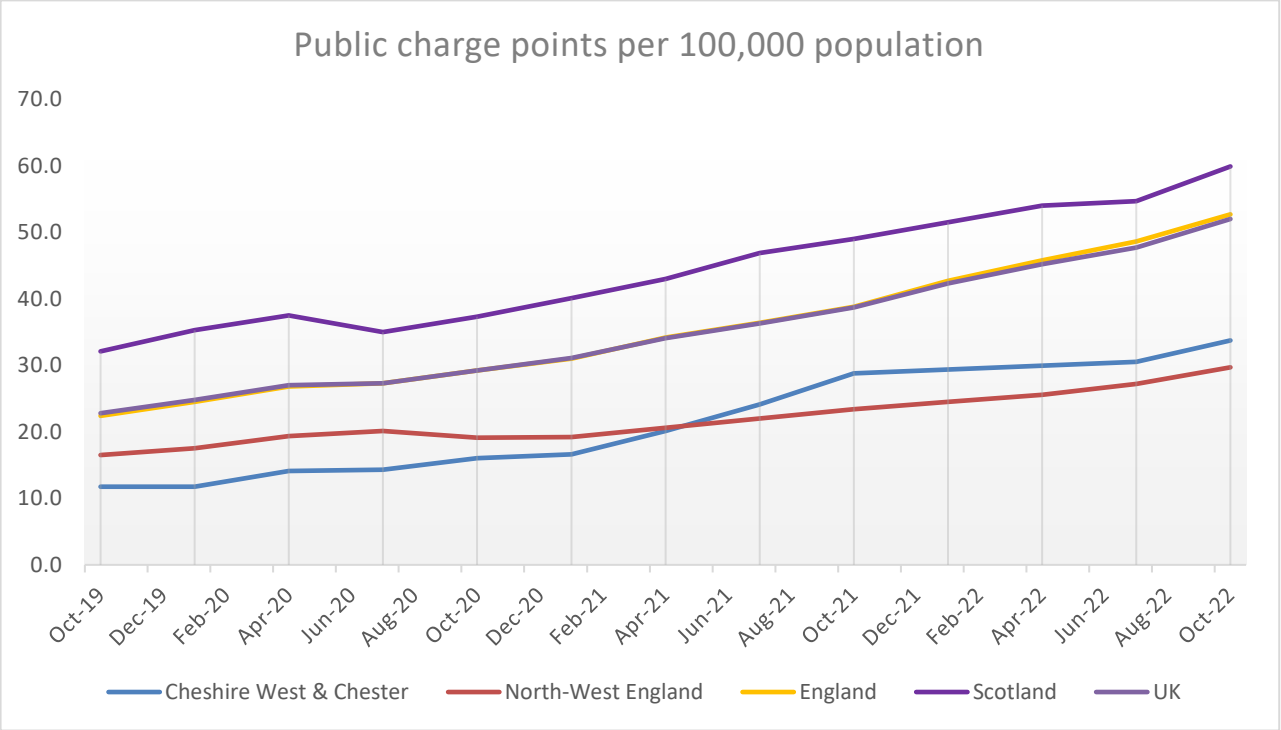

Figure 6.2/3: Regional comparison of public charge points per 100,000 population

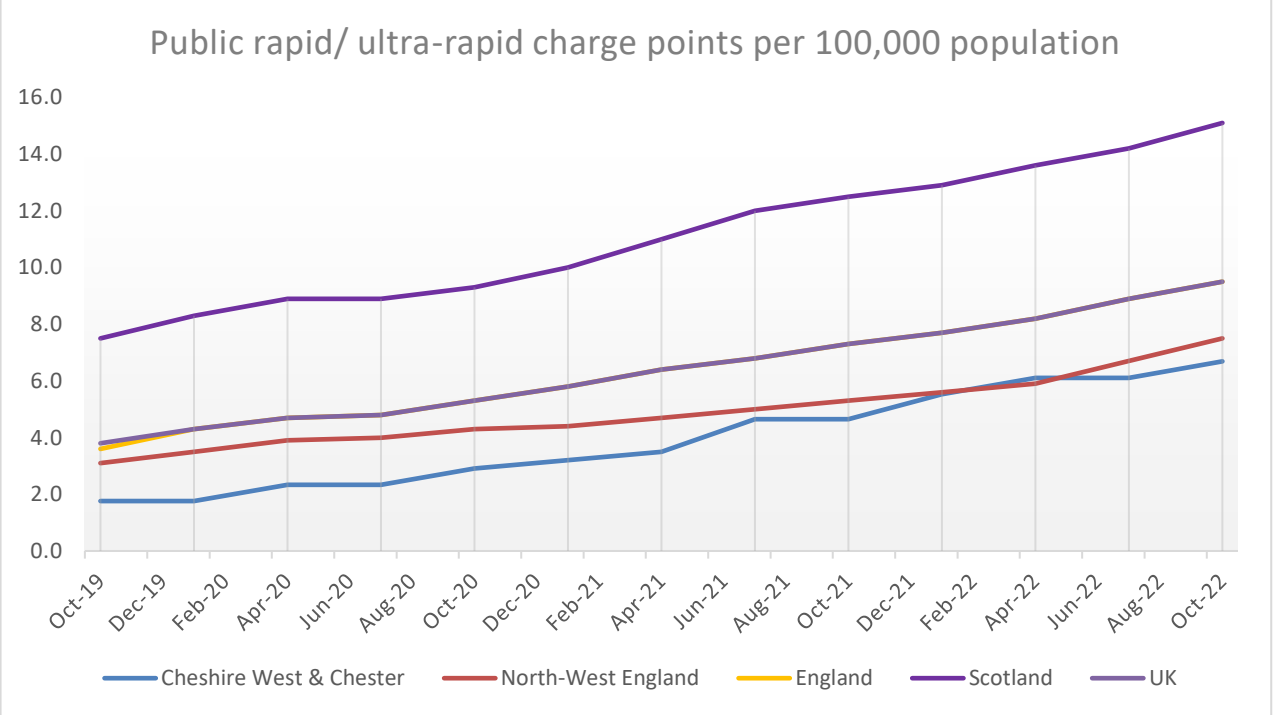

Figure 6.2/4: Regional comparison of public rapid/ ultra-rapid charge points per 100,000 population

Figure 6.2/5 shows the locations of the existing EV chargers within Cheshire West and Chester borough, categorised by charging speed. This shows that there is less charging infrastructure in central and southern regions of Cheshire West and Chester, with no rapid / ultra-rapid chargers and few fast chargers in operation at the time of writing. This is likely

to be due to the rural nature of these areas, which generally have a lower population and more dwellings with off-street parking than urban areas. These factors therefore result in lower demand for charging infrastructure. Furthermore, limited charging infrastructure along key corridors such as the A41, A49 and A51 reduces the viability of on-route charging.

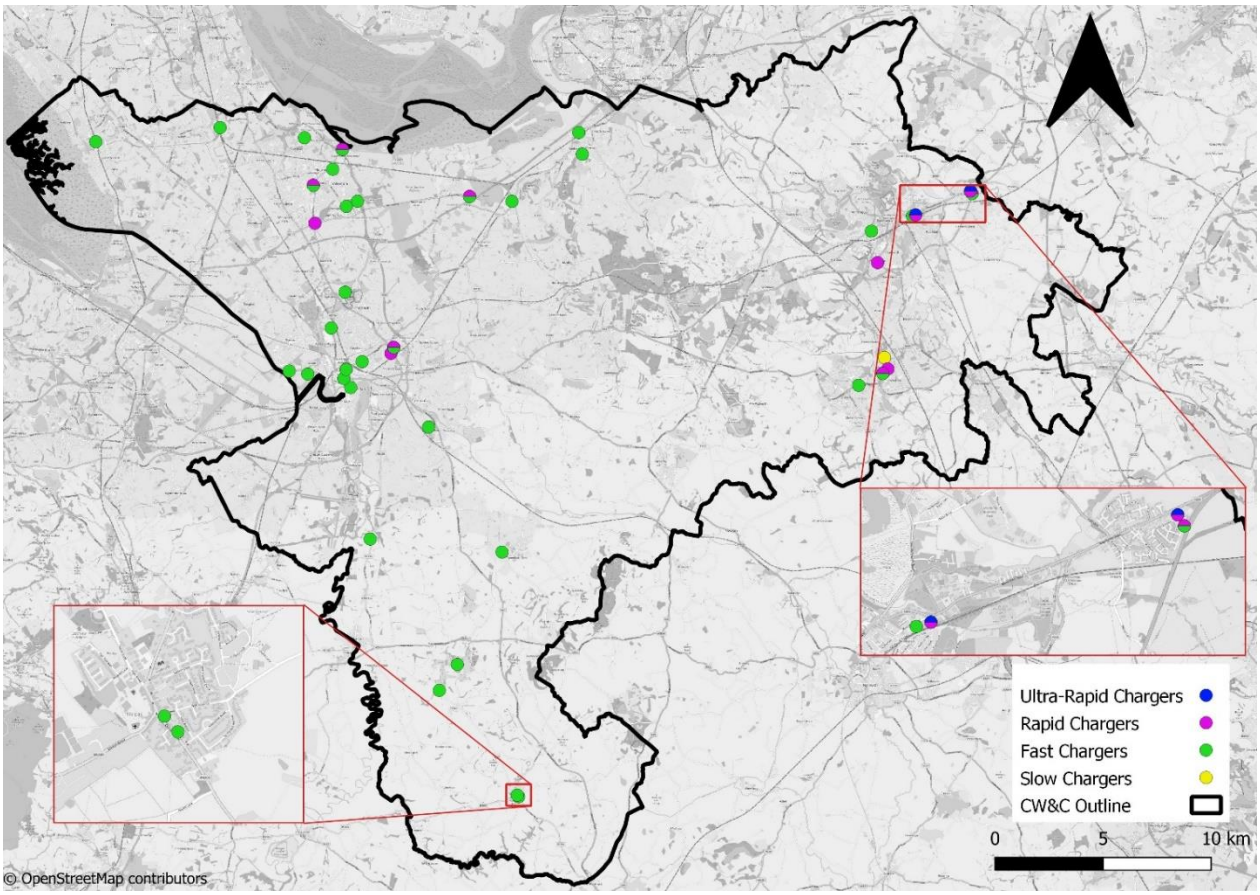

Figure 6.2/5 - EV Charging infrastructure in Cheshire West and Chester (Source: Zap-Map)

Council-led EVCI Installations to Date

The Council currently own and operate 34 fast chargers located in eight Council car parks across the borough, as well as 2 rapid chargers located adjacent to the National Waterways Museum in Ellesmere Port. The majority of chargers are twin charge points, allowing two vehicles to charge simultaneously and consequently there is presently capacity on the Council network for 69 vehicles to charge at the same time.

The chargers have been installed through a range of funding sources to supplement private and commercial chargers with the aim of supporting residents and businesses in the transition to electric vehicles.

Comparison with other Local Authorities

Figure 6.2/6 shows a comparison of charge points in Cheshire West and Chester against a number of similar sized authorities, in terms of population. The existing EVs per outlet ratio in the borough is above the UK average of 36.

District/ Area	Population (mid-2021)	Total EV registered (Q3 2022)	Total Number of outlets (Q4 2022)	Total EVs per outlet
Cheshire West and Chester	357,200	3,376	59	57
Cheshire East	398,800	5,633	69	82
East Riding of Yorkshire	342,200	2,748	29	95
Wakefield	353,300	2,298	60	38
Leicester	368,600	2,192	69	32
Coventry	345,300	2,916	678	4
Bournemouth, Christchurch, and Poole	400,300	3,169	62	51
Dorset	379,600	3,715	81	46
United Kingdom	67,281039	938,182	25,750	36

Figure 6.2/6: Cheshire West and Chester Area Charging Outlets Against Comparative Areas (Source: NCR, December 2020[9])

Current Utilisation within Cheshire West and Chester

Cheshire West and Chester hold EV charging utilisation data for locations that we are responsible for operating and maintaining. Using this data, Figure 6.2/7 sets out analysis of nine public sites with a minimum of two EV charge points, detailing the monthly average number of charges at each location and the average monthly power usage. **Error! Reference source not found.**6.2/8 shows the location of each of these chargers. Utilisation varies significantly by site and by area. Data relating to the new multi-storey carpark (MSC) at Northgate in Chester is not available as the site has not been open for long enough to allow proper comparison.

While each site will be used for a variety of charging purposes (residential, destination and on-route), to provide an indication of the predominant use case for each location, the following assumptions were made:

- Vehicles that are on-route would charge for up to 30 minutes.
- Vehicles using the location as their destination would charge for between 30 minutes and four hours; and
- Vehicles using the location for residential charging would charge for over four hours.

[9] The NCR is not updated as frequently as Zap-map, therefore higher figures may be quoted here than in other figures elsewhere in this report

Car Park	Area	EV Charge Point Type	Total Uses	Total kWh	Average Sessions per day	Average Power per session KW	Predominant Use (Estimated)
Bishop Street Car Park	Chester	4 x 22 kW fast charge points	1,456	29,145	4.0	19	Destination
Brook Street Car Park	Chester	4 x 22 kW fast charge points	1,177	13,921	3.2	12	Destination
Northgate MSC	Chester	21 x 7kW fast	-	-	-	-	TBC
Boat Museum	Ellesmere Port	2 x 22 kW fast	214	2563	0.6	12	Destination
Boat Museum	Ellesmere Port	2 x 50 kW rapid	2171	46087	5.9	21	Destination
Shrewsbury Road Car Park	Ellesmere Port	4 x 7 kW slow charge points	437	8,799	1.2	15	Destination
Moor Lane Car Park	Frodsham	4 x 7 kW slow charge points	502	6,044	1.4	13	Destination
Chester Road Car Park	Neston	4 x 7 kW slow charge points	1,074	19,981	2.9	19	Residential
Park Street Car Park	Northwich	4 x 22 kW fast charge points	325	9,289	0.9	26	Residential

Figure 6.2/7: EV Charge point utilisation (April – December 2021)

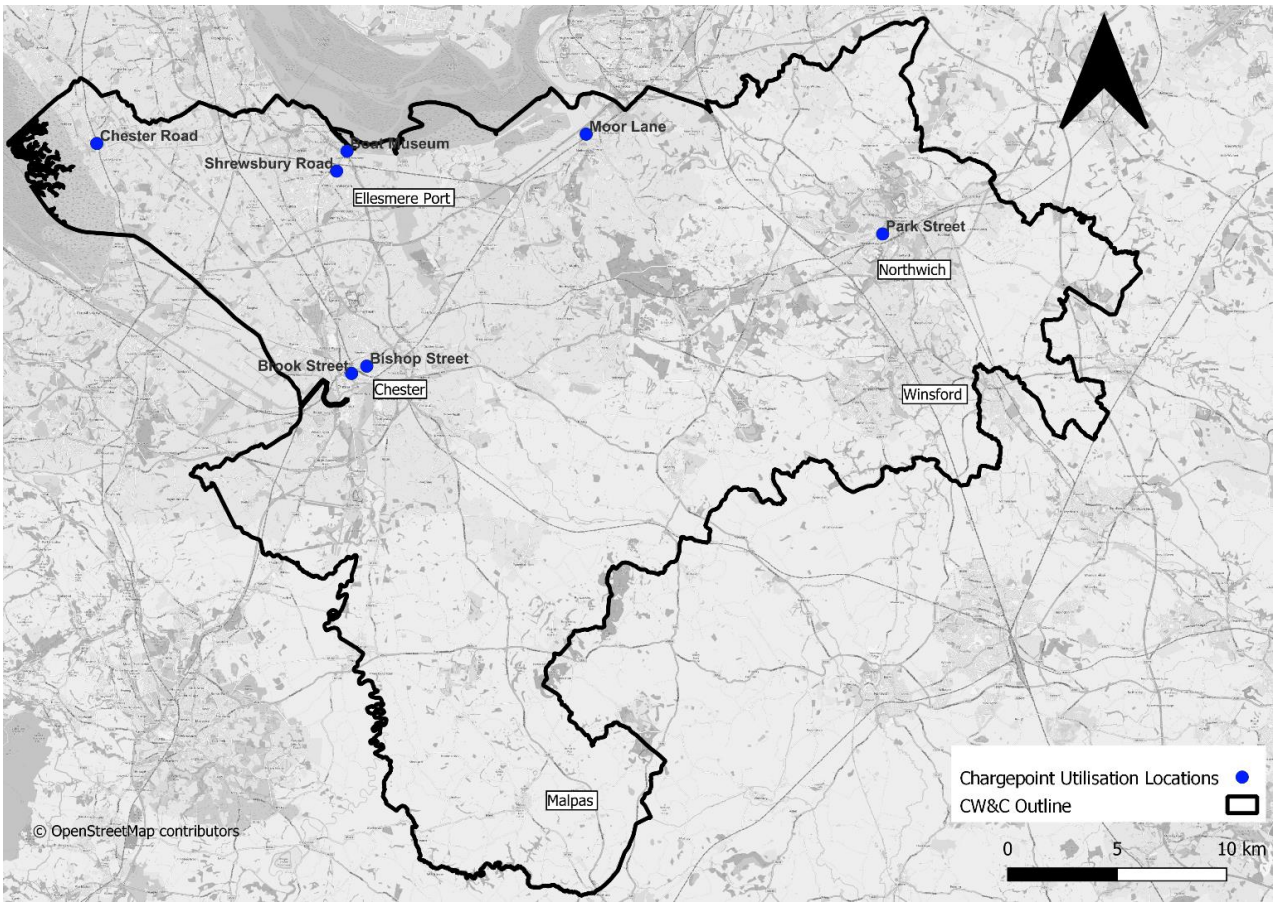

Figure 6.2/8: Charge point utilisation locations

The data suggests that the most popular charge point location is the Boat Museum Car Park, Ellesmere Port (6.5 uses per day/ overall 48,650 kWh). This is primarily because:

- It is situated near leisure, commercial and work facilities near Ellesmere Port.
- It is located close to the M53 motorway, which facilitates on route charging.
- There are few car parks in Ellesmere Port that currently have rapid EV charging infrastructure.

Bishop Street car park in Chester is also a highly performing charging site, likely due to its proximity to the retail area of Faulkner Street and the terrace housing of Westminster Road which offers limited off-street parking. In contrast, Moor Lane Car Park in Frodsham has the lowest usage (1.4 uses per day/ overall 6,044 kWh), despite being in the vicinity of the railway station and the high street.

The data suggests that, generally, the predominant use case for all sites is destination charging due to their proximity to retail and leisure facilities. However, Chester Road Car Park and Park Street Car Park predominantly support residential charging.

More detailed analysis of the data also demonstrates that, across all sites, usage rates are increasing year-on-year, likely linked to increased EV ownership in the local area. Installation of charging infrastructure gives local residents the confidence to purchase EVs, knowing they will be able to charge their new vehicles.

7.3. Taxis: Hackney Carriage and Private Hire Vehicles

From 2025, all newly licensed Hackney Carriage Vehicles licenced by Cheshire West and Chester Council must be zero emission at the tailpipe. Across the borough EVs are already starting to enter the Hackney Carriage and Private Hire Vehicle fleet.

The usage patterns of both forms of taxi mean that access to rapid and ultra-rapid charging are important in allowing drivers to maximise their productive work time. EVCI at company premises, and close to popular routes or ranks are beneficial to supporting the EV taxi business case.

While it is not within the scope of this strategy to define specific locations for charging for electric taxis, the strategy aims to ensure that public EV charging is available to all user types, including taxis. Slow charging will typically be unsuitable for taxis, which are usually charged at home or at a depot overnight but may need rapid charging provision to top up charge between trips during the day.

It should be noted that taxi ranks themselves are not appropriate locations for EV taxi charging, due to being located in areas of particularly high pedestrian footfall and the need for vehicles to continually move up the queue based on demand.

8. Anticipating Future Demand

A range of key factors can influence charging demand in different areas, including access to off-street parking spaces, demographics, geographic area, and commuter journey patterns. Chargers must be located in areas which are convenient to drivers, and have the space, energy, and network connections to make installations feasible.

8.1. On-street parking

Residents without access to off-street parking are unlikely to be able to accommodate private charging points, making it less attractive to transition to an EV both in terms of cost and convenience. Not everyone without off-road parking has a vehicle, and user habit trends are still emerging in relation to electric vehicles, but there are indications that around 25% of all cars nationally are currently parked on streets overnight[10]. This is confirmed within the National EV Charging Strategy[11]. However, a network of public chargers is essential for drivers who do high mileage, travel long distances and/or have no access to chargers at home or work. The National EVCI Strategy notes that 90% of all current EV drivers rely on the public charging network from time to time.

Figure 7.1/1 below provides an indication of households that are less likely to have access to private driveways and garages. The following dwelling types were considered to have limited off-street parking availability:

- Whole house or bungalow: Terraced (including end-terrace).
- Flat, maisonette or apartment: Purpose-built block of flats or tenement.
- Flat, maisonette or apartment: Part of a converted or shared house (including bed-sits).
- Flat, maisonette or apartment: In a commercial building; and
- Caravan or other mobile or temporary structure

Most on-street parking in Cheshire West and Chester is focused on the urban centres of Chester, Ellesmere Port, Neston, Northwich and Winsford, where terraced properties and high-density housing are key features of the urban landscape, and where air quality concerns are most acute.

[10] NTS0908 Vehicle mileage and occupancy - GOV.UK (www.gov.uk)

[11] Taking charge: the electric vehicle infrastructure strategy (publishing.service.gov.uk)

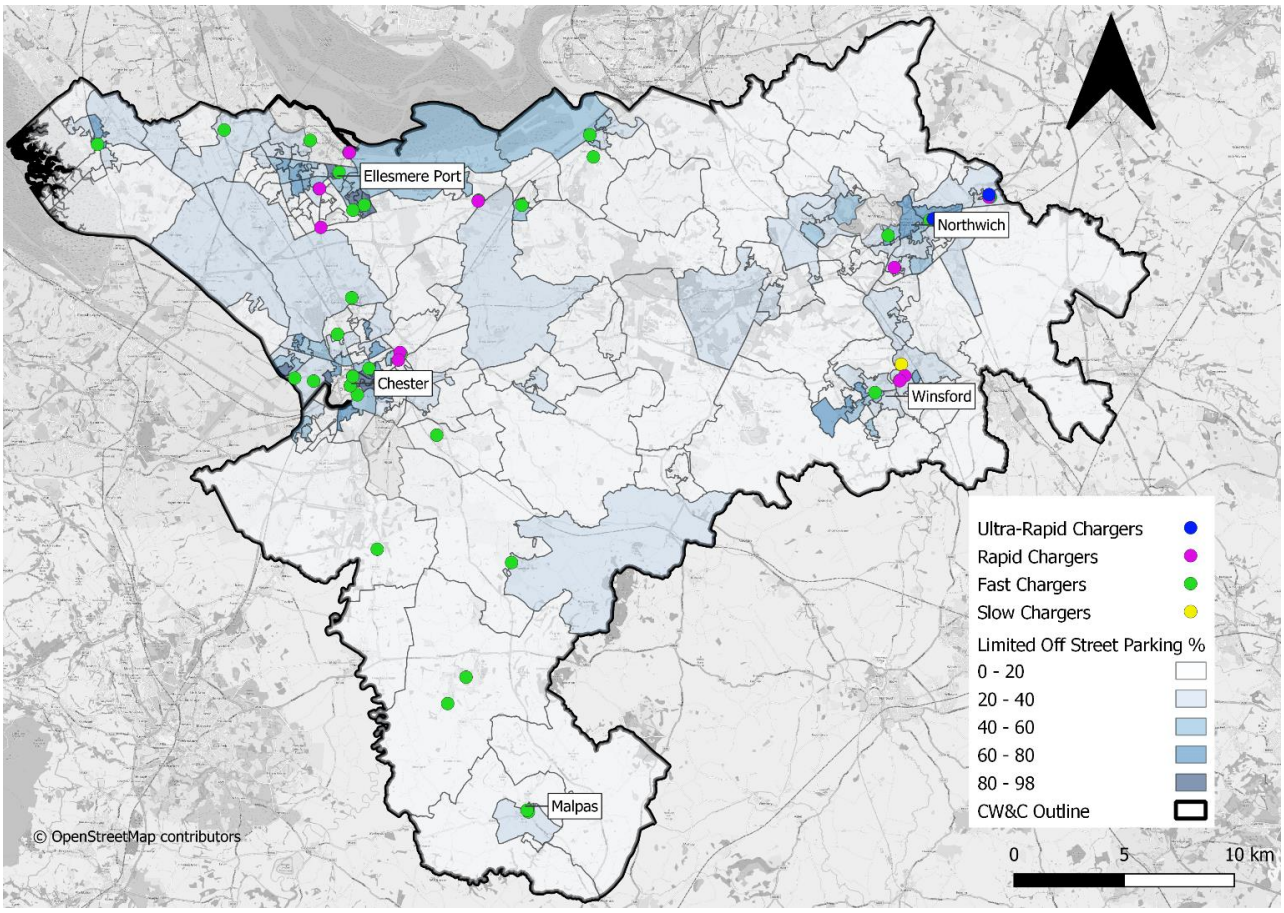

Figure 7.1/1: Existing Charging Points and Limited Off-Street Parking Availability (Source: Census 2021)

8.2. Demographic Analysis

As set out in Section 4.1, there is currently an established link between income levels and the uptake of EVs. As this trend is expected to continue into the medium-term, income data has been analysed to help understand where stronger uptake of EVs may come forward. However, this strategy also considers how a balanced network can be provided across the borough, and the benefits of electrification do not solely benefit drivers (if delivered as part of a comprehensive multimodal strategy).

Figure 7.2/1 shows the English Indices of Deprivation (EID) across the borough. This analysis suggests that the most deprived areas include the areas North and East of Ellesmere Port, Winsford, Northwich and some areas of Chester. The least deprived areas are outside of the main urban areas and focused on the centre and north of the borough.

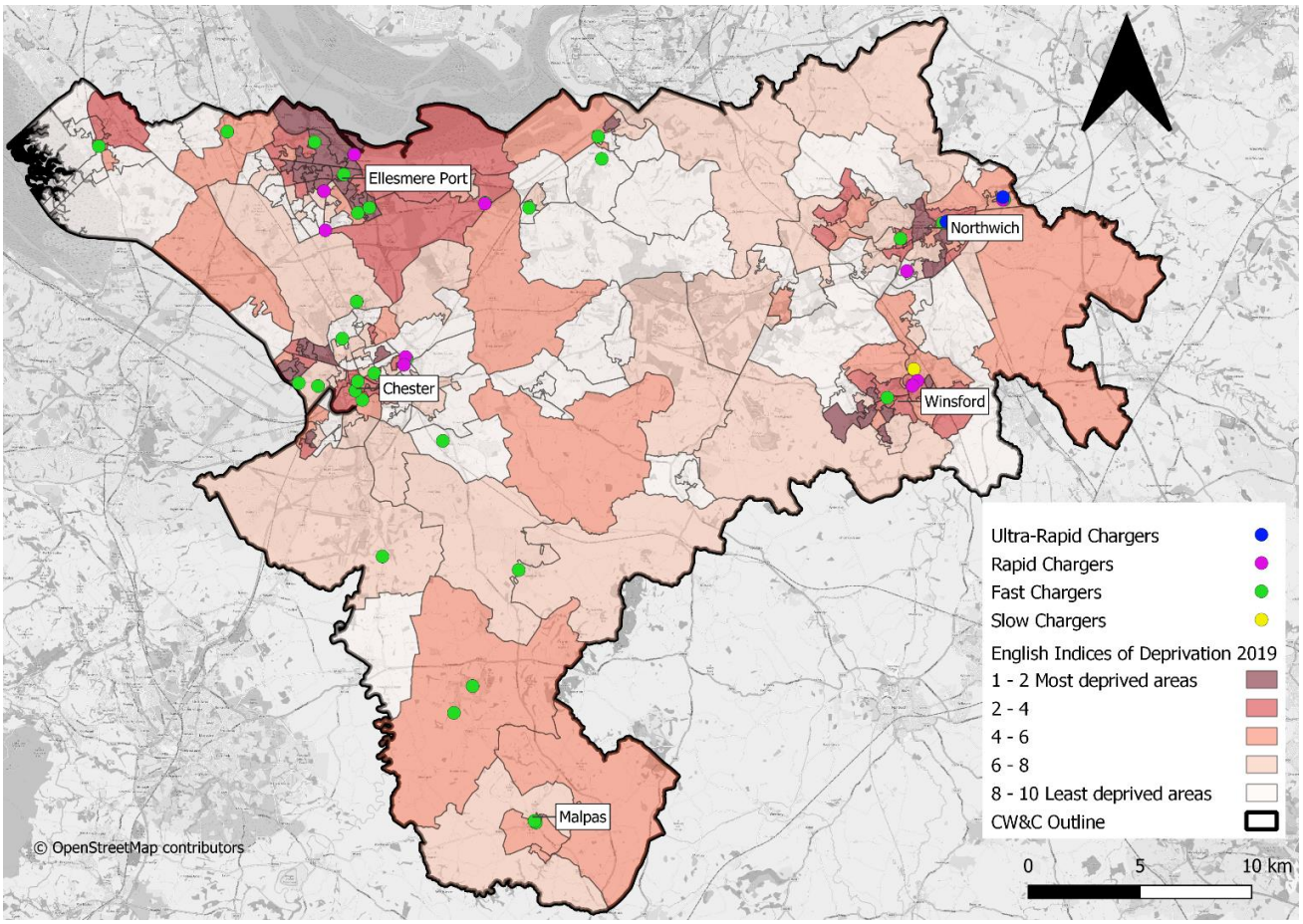

Figure 7.2/1: English Indices of Deprivation across Cheshire West and Chester Borough (Sources: Zap-Map and GOV.UK)

8.3. BEV and PHEV Ownership

Figure 7.3/1 presents Battery EV (BEV) ownership across the region, whilst Figure 7.3/2 presents PHEV ownership. While overall ownership remains low, ownership is higher in the east and central areas, this follows the general pattern of the EID as discussed above. Areas located on key commuter corridors tend to experience higher levels of ownership.

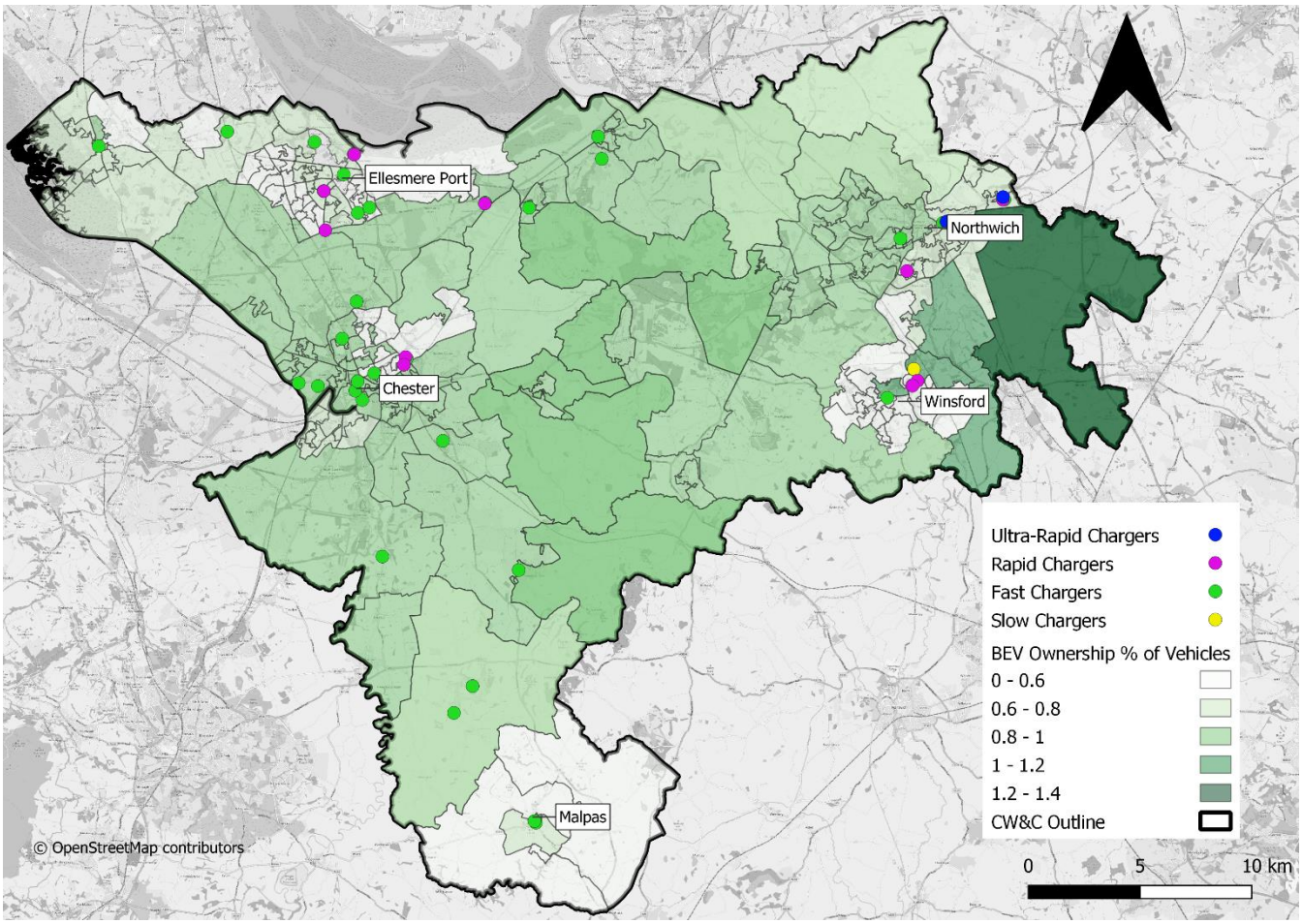

Figure 7.3/1: Battery EV Ownership (Source: Zap-Map and GOV.UK)

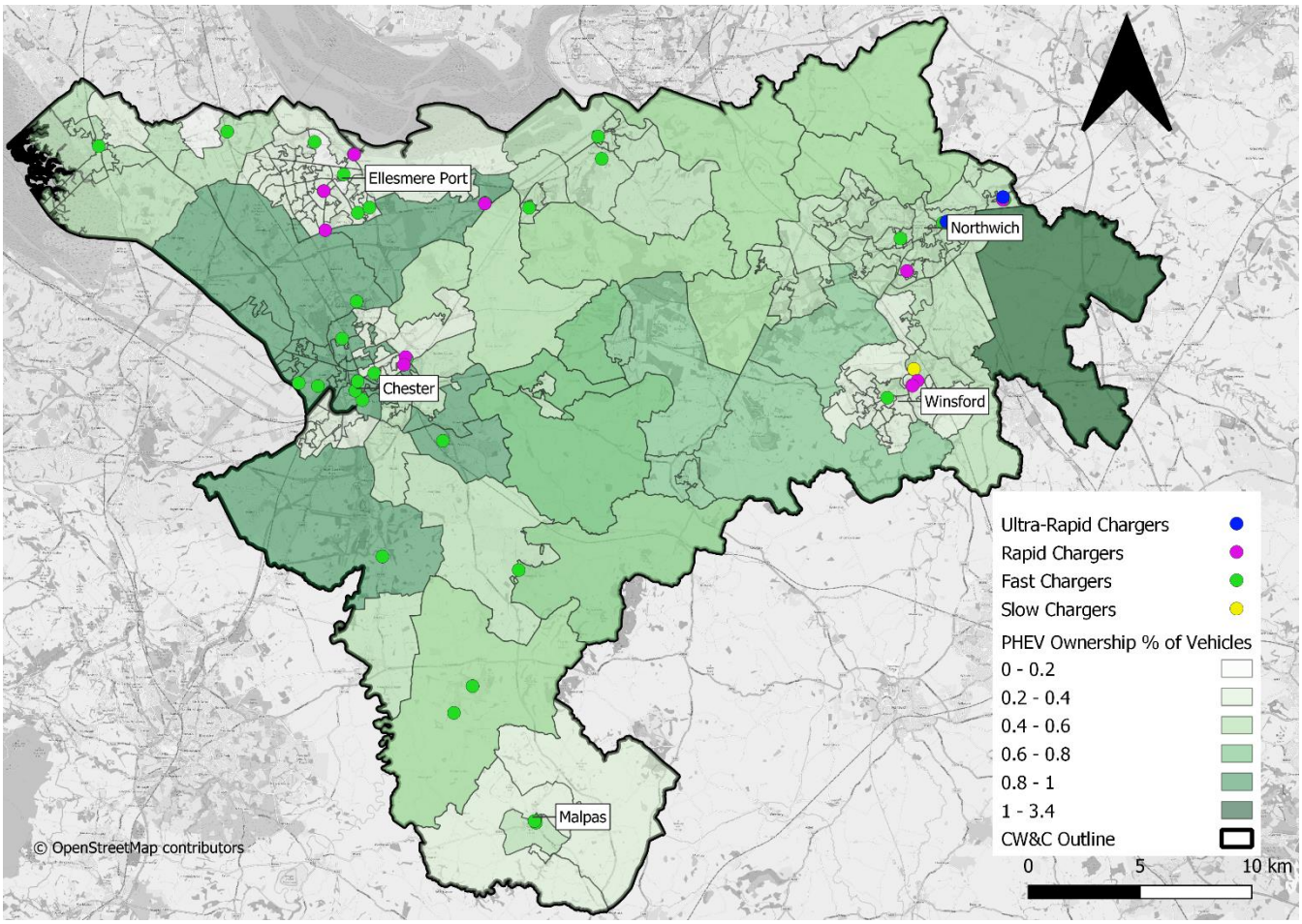

Figure 7.3/2: Plug-In Hybrid EV Ownership (Source Zap-Map and GOV.UK)

National EV Insights and Strategy EV Uptake Forecasts

The National EV Insights and Strategy (NEVIS) service, delivered by CENEX, is a national tool developed to support English local authorities in the development of their electric vehicle charging infrastructure strategies. It provides reliable, independent, up-to-date information on Electric Vehicles and EVCI

Figure 7.3/3 below provides a forecast of EV uptake by fuel type to 2050, based on a scenario including the proposed 2030 ban on the sale of new petrol and diesel cars and vans. It is important to note that the average lifespan of vehicles means petrol and diesel vehicles will continue to make up a substantial portion of the overall fleet of vehicles until the late 2030s.

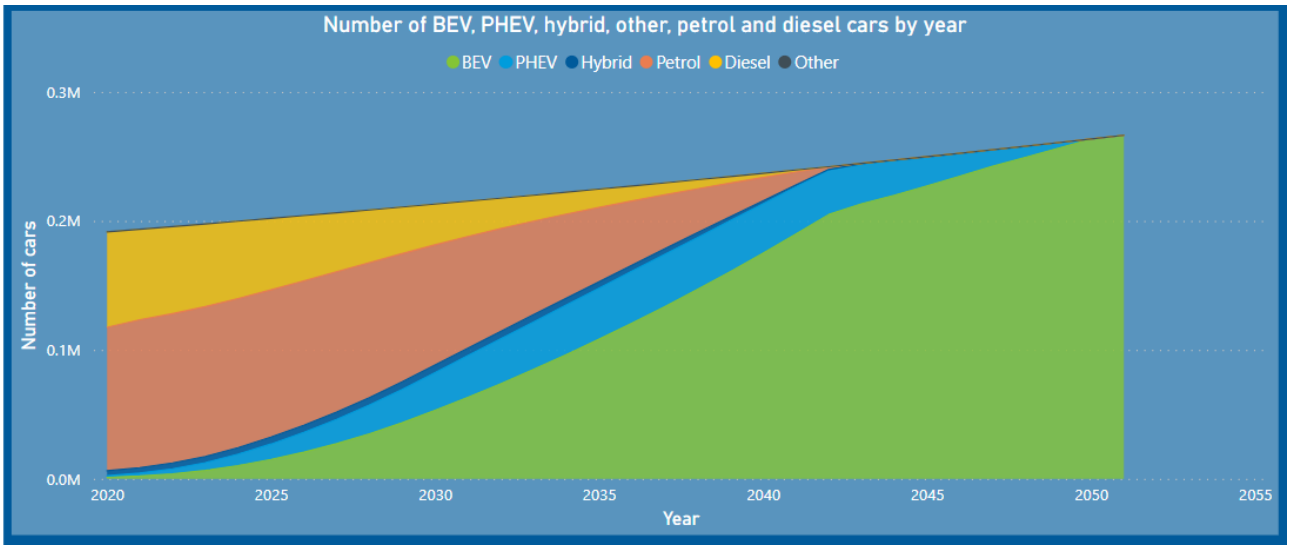

Figure 7.3/3: Projected uptake of EVs in Cheshire West and Chester borough by fuel type 2020-2051 (Source: NEVIS Insights Toolkit, 2022, Cenex)

8.4. Spatial Modelling – Future Uptake of EVs

The Council has utilised a geospatial model to forecast increase in uptake of electric vehicles across the borough until 2050. Details of the model are set out in Appendix 1.

The spatial results for EV uptake across Cheshire West and Chester are shown in Figure 7.4/1. This shows that the greatest variation in EV uptake density occurs between 2025 and 2035, particularly within the main urban areas. However, except for Helsby and Frodsham, the model forecasts that settlements central and in the south of the borough will not experience significant increases in EV density until at least 2035. The distribution of EVs within the borough generally follows population density.

Given government commitments to introduce a 2030 ban on sale of diesel and petrol vehicles, and in line with Figure 7.3/3 above, it is assumed that almost all non-electric vehicles will be removed from the network by 2045. Growth in EVs from this date will be predominantly driven by demographic changes, new residential/ commercial developments, and changes in society's relationship with transport. Accurately predicting the scale of change beyond this point, which could be induced by any of these variations, is out of scope for this strategy.

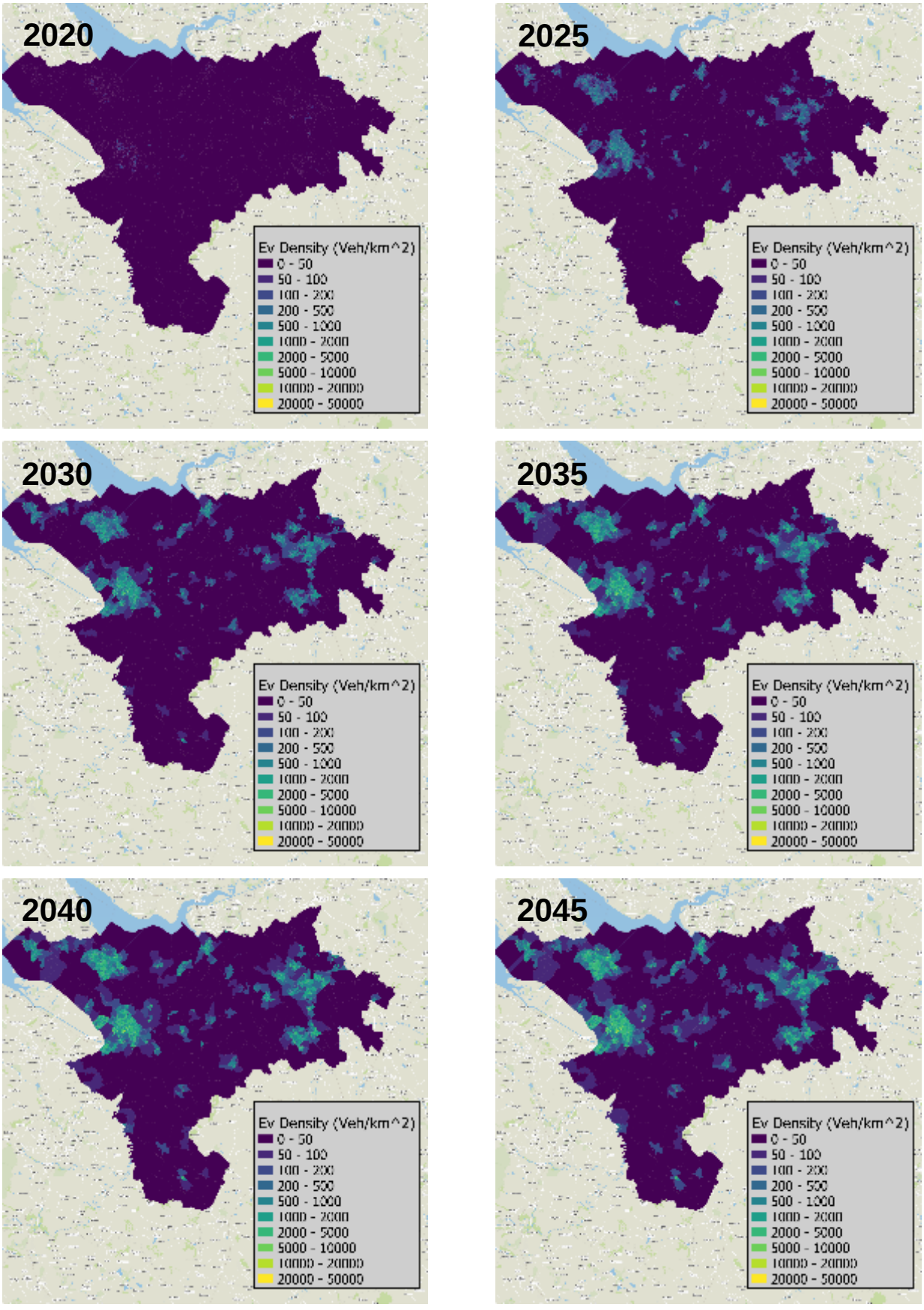

Figure 7.4/1: Spatial uptake of EVs by forecast year

8.5. Commuting and Travel Pattern Analysis

In addition to uptake of EVs and demographic factors, the demand for EVCI will depend on the movement of vehicles. Journey to work data from the 2011 census has been used to estimate commuting journeys within the borough. This has been combined with data from the National Trip End Model to provide an estimated ratio for weekday to weekend trips.

Figure 7.5/1 shows the ratio of long to short journeys within the borough, collated by where journeys begin and end. Within the map, the areas with a higher ratio (those in yellow/ orange) have a greater proportion of long-range trips. Where longer journeys are forecast (primarily rural areas), this suggests that these areas would require more frequent charging.

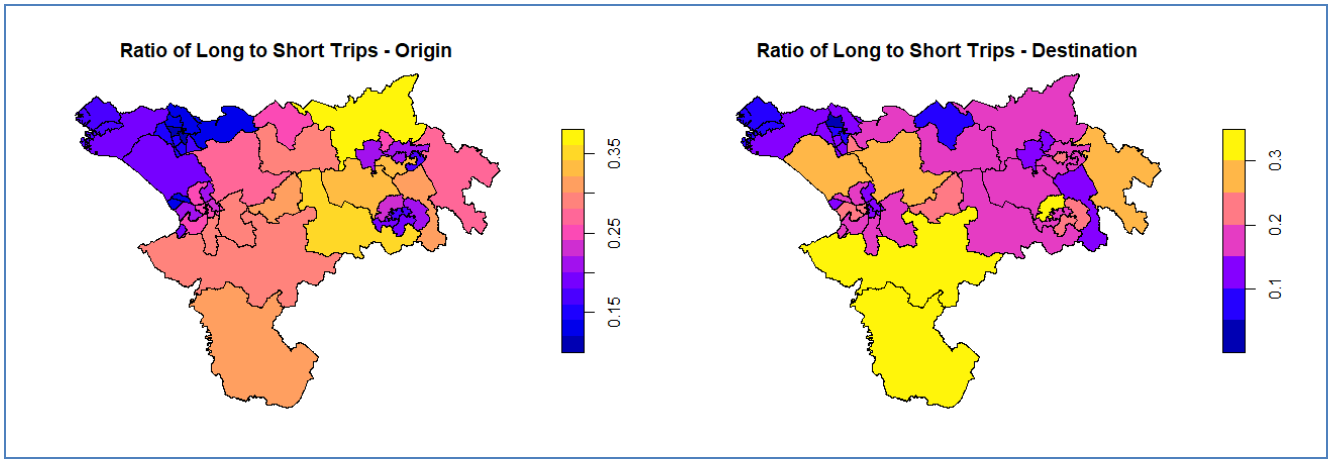

Figure 7.5/1: Ratio of long to short journeys for destinations and origins

Figure 7.5/2 shows the ratio of weekend trips to weekday trips. The areas with a higher ratio are those where the trips during the weekend are greater than those during the week. Weekend trips are likely to be generated by leisure and other non-work-related activities, which could serve as an indicator for charging during non-weekday time periods. Areas around Winsford and Northwich show substantially lower ratios than average, likely caused by the different usage patterns and a concentration of different usage types.

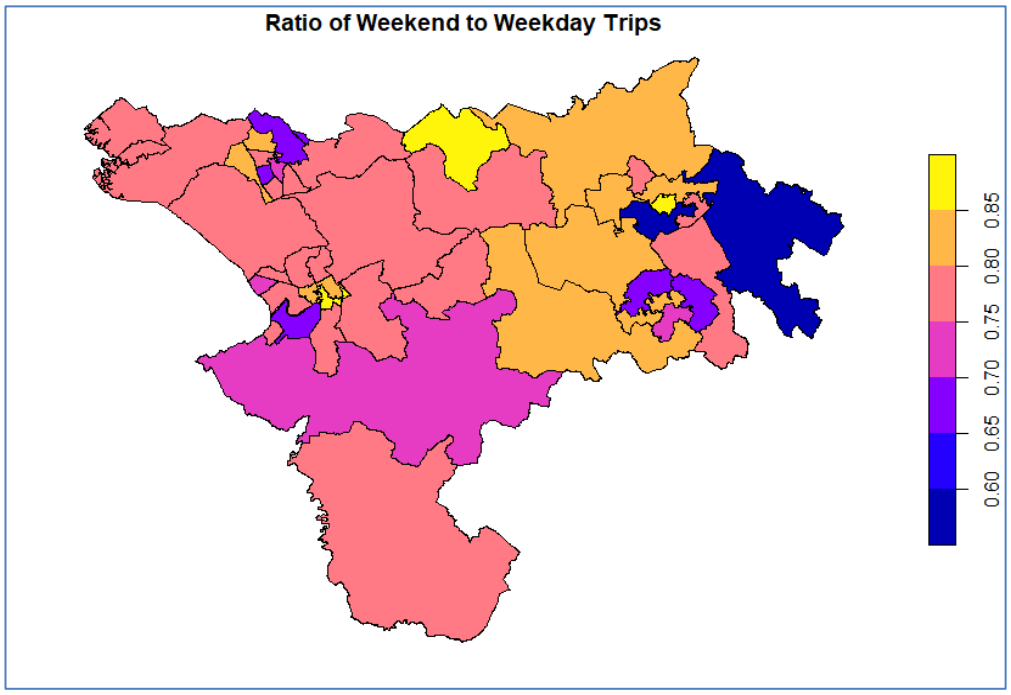

Figure 7.5/2: Ratio of weekend to weekday journeys

Finally, Figure 7.5/3 shows the ratio of work to non-work trips across the borough. The few areas showing a higher proportion of weekend to weekday trips also have a comparative reduction in work trips compared to non-work trips. This suggests that:

- Chargers with lower power could be provided in areas of high weekday workplace trips (by destination) because they serve people who are parked for a longer period of time
- The provision of rapid charging on route may be less necessary, because that the vehicle will likely be stationary for an extended period of time at their destination. If their destination was a typical non-workplace destination (sporting event, shopping etc.), the dwell time of the vehicle would be less, meaning a reduced capacity to charge.

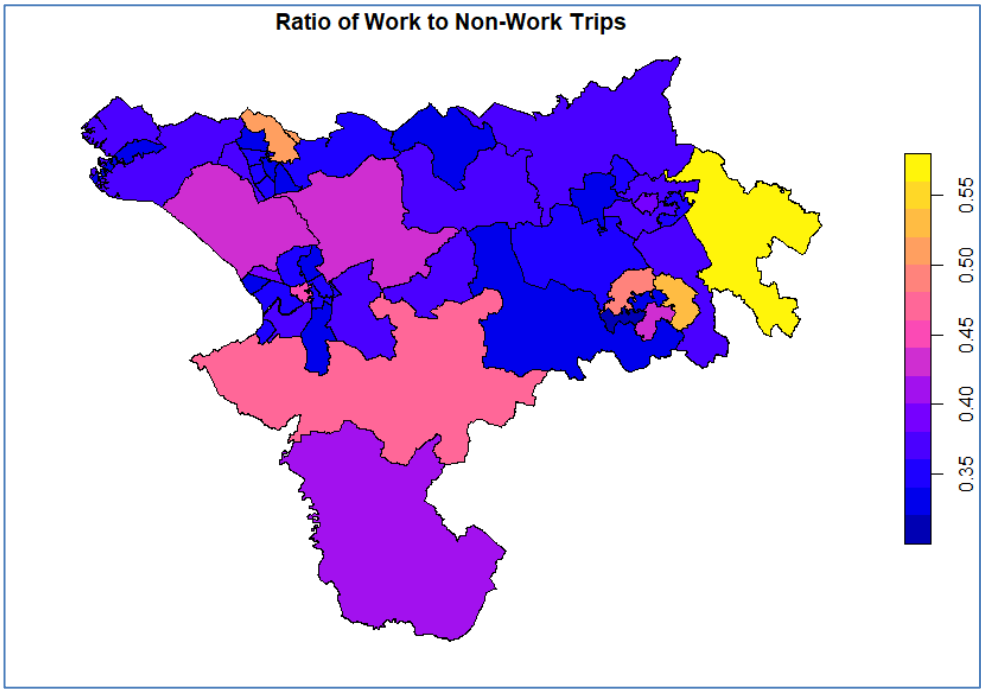

Figure 7.5/3: Ratio of work to non-work trips

8.6. Second Hand Uptake

The majority of analysis of EV uptake focuses on the purchase of new EVs, as it is the influx of EVs into the overall vehicle marketplace that will determine the overall success of the transition to electromobility. However, the final distribution of those vehicles (such as where they are parked at night, where they are parked during the day, who owns them etc.) will also be determined by the second-hand market.

Data on second hand purchases of EVs is difficult to obtain. As current levels of EV ownership are relatively low, the probability of those EVs being sold on second-hand is even lower. However, in the future this could be a key market in Cheshire West and Chester due to affordability and strong sales of nearly new vehicles.

The RAC report "Car Ownership in Great Britain"[12] shows the average length of time that a new vehicle is owned for, at circa 14 years. Based on the assumption that a new vehicle, once sold on, is then distributed across the local area purely weighted by the overall level of vehicle ownership, it is possible to produce an approximate estimate of EV population distribution.

Figure 7.6/1 shows that the total number of second-hand EVs is expected to steadily increase from 2025 and form a majority of total EV sales by approximately 2035. Therefore, analysis and procurement of EVCI beyond 2030 must take this into account to ensure that the charging network remains accessible to all owners.

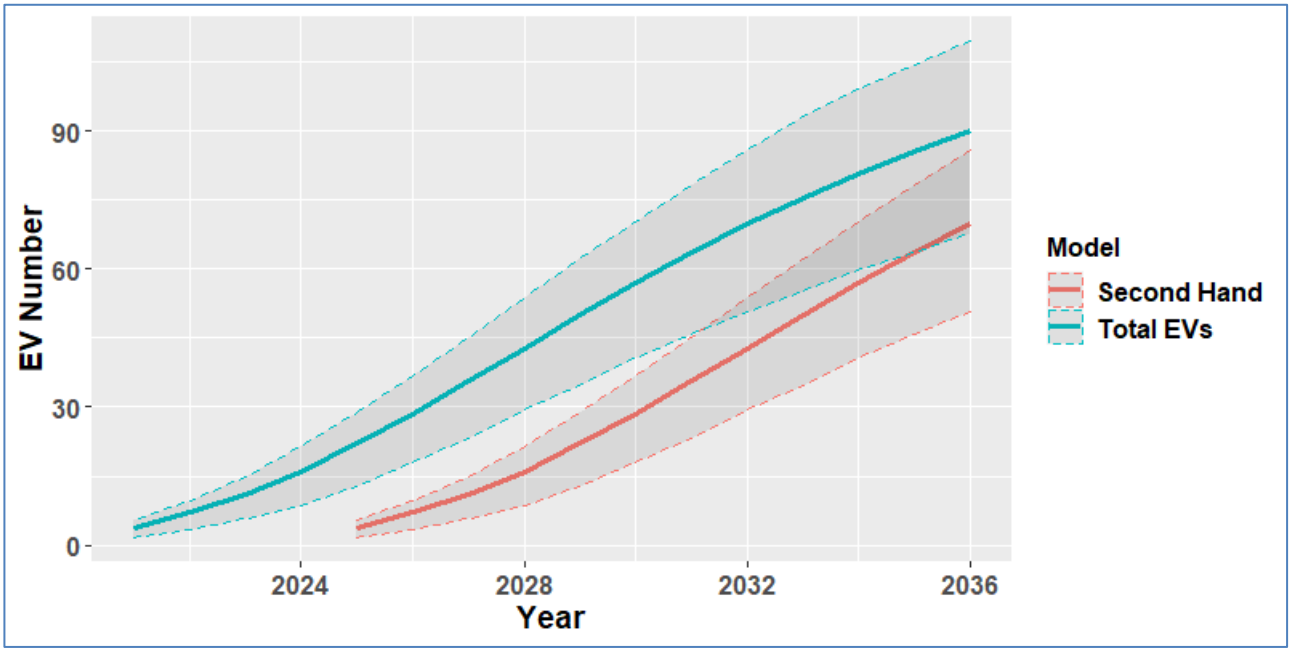

Figure 7.6/1: Estimated second-hand EV uptake rates

As shown in Figure 7.6/2, the inclusion of second-hand vehicles leads to a redistribution of EVs from the original high uptake areas (urban centres) to those which were not previously expected to see as much demand (rural areas) within the borough. However, it should be noted that growth in the second-hand EV market is later than new EVs, and any associated EVCI demand will therefore also follow later.

[12] https://www.racfoundation.org/wp-content/uploads/2017/11/car-ownership-in-great-britain-leibling-171008-report.pdf

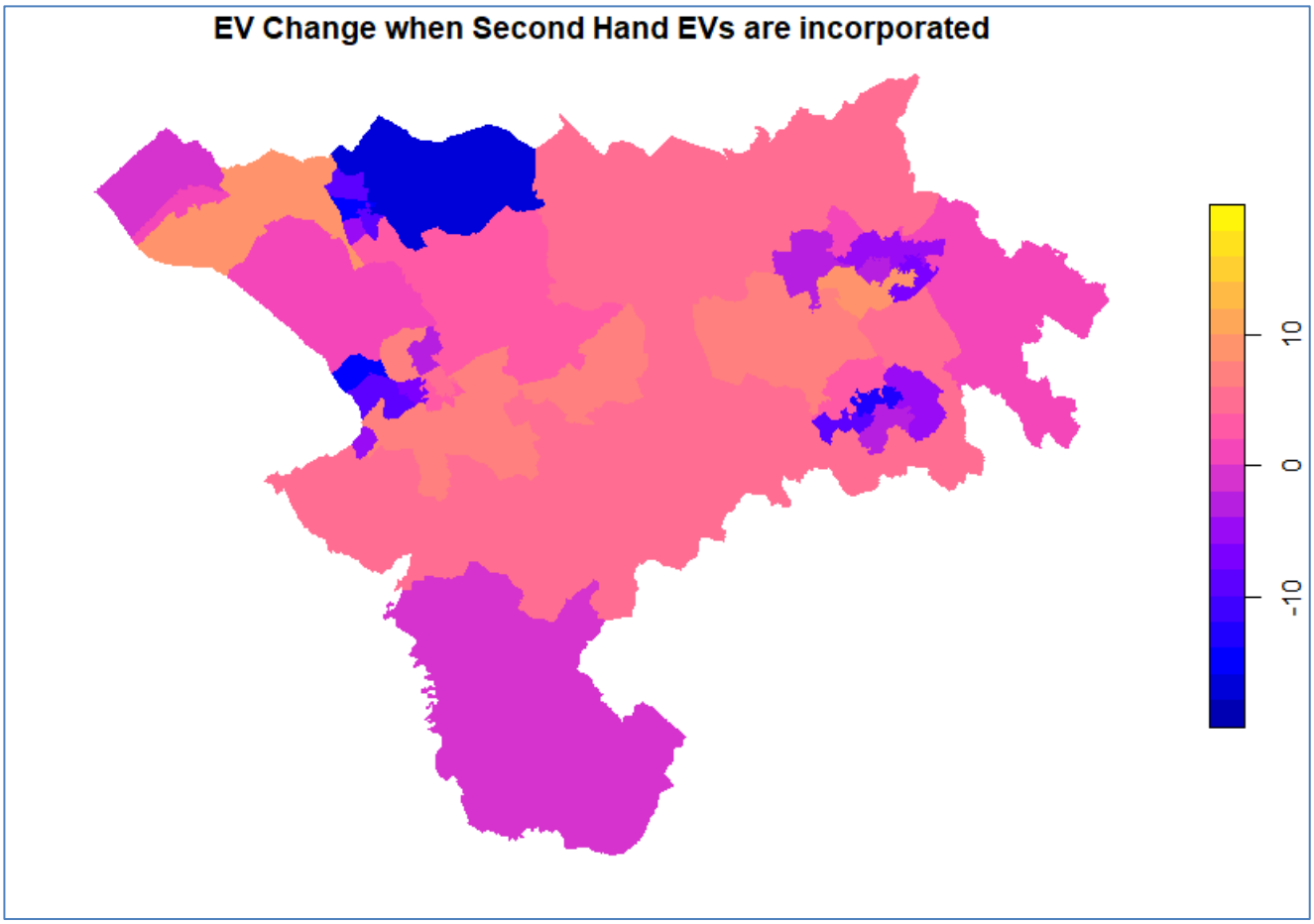

Figure 7.6/2: The impact of second-hand EV market on EV uptake distribution

8.7. How Many Charge Points Does Cheshire West and Chester Need?

Transport for the North Electric Vehicle Charging Infrastructure Framework

Published in 2022, the Transport for the North EVCI Framework uses regional analytics to develop a place-based understanding of future EV uptake and charging need. Across the North of England, it identifies a total public charging requirement of 39,000 to 54,000 by 2025, and 123,500 to 161,200 by 2030. Forecast requirements in Cheshire West and Chester are set out in detail in Appendix 6 and are summarised in Figure 7.7/1 below.

Charge point use case		Destination Charging	HGV Depots	Home Charging	Public Residential	Workplace Charging
Status		Public / Private	Private	Private	Public	Private
Total EV Charge points Required	2020	10 – 15	24	1100	18 – 23	11-12
	2025	210 – 870	160	15000 – 28000	360 – 800	190 – 310
	2030	660 – 1800	180 – 190	58000 – 80000	1200 – 1700	580 – 640

	2035	930 – 2700	620 – 660	11000 - 13000	1900 – 2600	830 - 980
	2040	940 – 3100	780 – 850	15000 – 16000	2000 – 2900	820 – 1100
	2045	930 – 2900	850 – 950	17000	2000 – 2700	820 – 950
	2050	910 - 2700	850 - 980	18000	2000 – 2600	790 – 870

Figure 7.7/1: Forecasted EV Charge Point Demand (Source: TfN)

The TfN Framework also provides an indication of key locations for locating rapid and ultra-rapid chargers for on-route charging (See Appendix 6). Areas identified on a regional scale are Chester, Ellesmere Port, Frodsham, Northwich, Winslow and Tarvin, with Chester and Ellesmere Port being identified as key points of focus at a local authority scale.

EVCI Rapid Charger Model

Rapid chargers (capacity of approx. 50 kWh) serve a wide range of use cases, including destination and on-route charging as well as charging for service vehicles such as taxis. The analysis above demonstrates there is a particular shortage of rapid and ultra-rapid charge points across Cheshire West and Chester. To guide the development of a base network in the short to medium term, an indicative model has been developed to estimate the number of rapid chargers required. Details of the methodology for this model is contained in Appendix 5.

The assessment using this model suggests a need for between 17 and 50 rapid chargers to satisfy current demand, and between 113 and 325 rapid chargers by 2025. With 23 rapid public chargers currently in place across the borough, this suggests a remaining need for up to 300 additional rapid or ultra-rapid charge points by 2025 to increase the potential for on-route, destination, residential and taxi charging. Key locations include expanding rapid provision in Chester and Northwich.

National EV Insights and Strategy Charge Point Demand Forecasts

The National EV Insights and Strategy (NEVIS) service, delivered by Cenex, is a national tool developed to support English local authorities in the development of their electric vehicle charging infrastructure strategies. It provides reliable, independent, up-to-date information on Electric Vehicles and EVCI

Figure 7.7/2 below sets out the NEVIS forecasts for Cheshire West and Chester borough based on a medium scenario including the target of a 2030 ban on the sale of new petrol and diesel vehicles.

Year	**7kW charge points required** (Slow)	**22kW charge points required** (Fast)	**50kW sockets required** (Rapid)	**150kW sockets required** (Ultra-Rapid)
2020	19	5	2	1
2025	228	31	13	4

2030	894	68	33	19
2035	1424	108	52	48
2040	1694	127	62	90
2045	1731	166	61	140
2050	1733	191	47	201

Figure 7.7/2: Forecasted EV Charge Point Demand, 2030 ban (medium) scenario (Source: NEVIS Insights Toolkit, Cenex 2022)

8.8. Conclusion: Forecasts of EV Demand

Future levels of demand for EVCI are currently subject to a high degree of uncertainty, principally focused on uptake of EVs, technological developments and consumer charging behaviours. However, there is a significant gap between current supply and upcoming demand. While the vast majority of EV charging is likely to take place at home over night, there is likely to be substantial demand for charging at key destinations, including workplaces, and there is a need to accommodate public 'home charging' for households who currently park on-street. There is also a significant role for private charging facilities, such as at workplaces and fleet depots, and the Council can play a key role in leading the way in relation to its own staff and fleet.

Regionally, the north-west of England is significantly underperforming in terms of the number of charge points per head of population. Within Cheshire West, there is a particular demand for public rapid- and ultra-rapid charge points, with a forecast need of at least circa 300 by 2025 against a current provision of 23. Latest national data suggests Cheshire West and Chester is currently falling behind even regional averages in terms of rapid/ ultra-rapid EVCI.

Geographically, early demand for EVs is likely to primarily centre on key urban centres, particularly Chester, Ellesmere Port, Northwich and Winsford. This suggests these locations should be the primary focus for roll-out of EVCI in the short-term. However, as EVs become more widely adopted, and particularly as the second-hand EV market begins to develop, this geographical divide is forecast to become significantly less pronounced, and focus may then shift to providing EVCI in more rural communities where trip lengths tend to be longer, meaning greater reliance on public charging infrastructure.

9. Delivering Electric Vehicle Charging Infrastructure

9.1. The Council's sphere of influence

The Cheshire West and Chester Electric Vehicle Charging Infrastructure Strategy will focus on the measures and policies the Council can either carry out directly or influence:

- **Direct control** – measures to improve EV infrastructure provision on the Council's own estate, defined as the Council's own operational buildings or at Council owned or managed public parking, and through the procurement or licensing of EV charging infrastructure.

The Council also has extensive direct and indirect spheres of influence:

- **Direct influence** – measures that will have a direct impact on the EV infrastructure provided by others, such as through planning and infrastructure policies.
- **Wider influence** – through partnerships, advice, lobbying and leadership.

Viewing the challenges for EV charging infrastructure through these three lenses gives us an indication of what actions the Council can take, how they can be prioritised, and what impact they are likely to have on the development of EV charging infrastructure over the coming years.

Potential Commercial Sites

A key objective of the Cheshire West and Chester Electric Vehicle Charging Infrastructure Strategy is to ensure the network delivered offers good value for money, both for users and for the Council itself. As such, it is important to ensure that any investment in EVCI does not duplicate known investment plans from the private sector or other partners.

Figure 8.1/1 illustrates the analysis and mapping of potential commercial sites in Cheshire West and Chester borough, alongside existing charge points. These sites include:

- BP and Shell forecourts with both companies committing to installing charge points.
- Supermarkets, who are increasingly working with charge point operators and private car manufacturers to bring forward EV charging.

There are generally more potential commercial sites located to the north of the borough, concentrated in and around Chester, Ellesmere Port, Northwich and Winsford. Commercial sites in dense urban areas are likely to support destination charging patterns. Furthermore, users are likely to stay at these sites for enough time to sufficiently charge their EV, supporting the case for investing and implementing charging infrastructure at commercial sites.

Outside of the main urban areas, there are fewer potential commercial sites in smaller towns such as Helsby, Frodsham and Tarvin. There are no potential commercial sites located south of Chester and Winsford, apart from Farndon. These areas may need to be a focus for public sector intervention, although they also demonstrate lower EV uptake in the short-term.

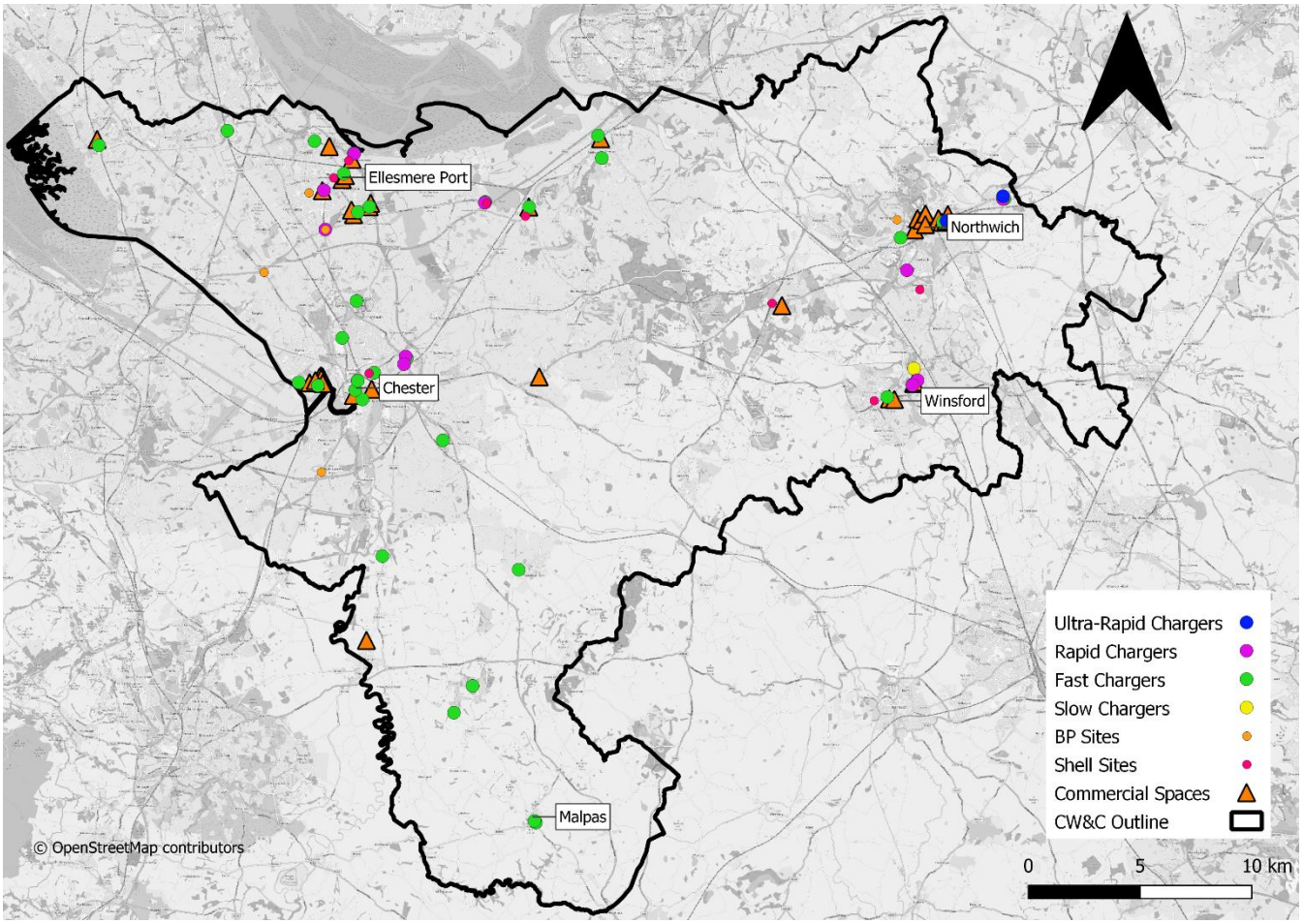

Figure 8.1/1: Potential Commercial Sites

9.2. Direct Control – Delivering Public EVCI

As demonstrated in Section 7, predicting the absolute number of EV chargers that will be needed in the future is highly complex. Rapidly changing vehicle and charging technologies, economic factors and dependence on public behaviour change means there is a great deal of uncertainty. Moreover, any simple metric does not differentiate between the different charger speeds, tariffs, and how or when charge points are accessible.

Public Charging in Local Authority Car Parks

Cheshire West and Chester Council direct control of off-road car located across the borough, in addition to other car parking on street and at leisure and community centres.

Charging in public car parks can be a valuable resource for destination charging and can also have great value for local residents without access to a private driveway or garage where they can charge from their home power supply.

The Council also controls a number of Park & Ride sites surrounding Chester, aimed at reducing the number of car trips into Chester City Centre. As part of a wider strategy for the future of the Chester Park & Ride, we will examine the case for installation of appropriate electric vehicle charging infrastructure at these sites where it would complement the function of the Park & Ride service.

As uptake of EVs grows over time, we will continue to monitor the usage of Council-owned

charge points to help us to identify sites of particularly high demand where additional charging infrastructure may be required. This will help to mitigate risks associated with drivers queuing to charge their vehicles, such as inconsiderate parking within car parks or in nearby areas.

Charging at home for those without off-road parking

As shown in Section 7, many households in Cheshire West and Chester have no access to private off-road parking, and subsequently have limited or no access to home charging. This is a significant barrier to EV uptake for many households.

Without support, some drivers may attempt their own fixes. Nationally, we have already seen examples of EV drivers trailing cables across the public footway to charge vehicles from their homes. This presents a significant trip hazard (even with a covering mat), is detrimental to inclusive mobility, and may contravene the Highways Act 1980. The Council therefore does not permit this form of EV charging as standard.

The installation of EV chargers on the public highway, if not carefully managed, may also generate street clutter and create negative impacts for road users; in particular, pedestrians and those with disabilities, potentially compromising the Council's commitment to inclusive mobility

Providing safe alternative access to EV charging for people who must park their car on the street is therefore critical to the UK's transition to EVs, and the protection of inclusive mobility for road users with additional needs. Cheshire West and Chester Council, as the local highways authority, recognises the need to enable safe access to EV charging for residents who do not have opportunity to charge their car off-street as part of the broader programme of net zero transport.

It is also important to note that, even with older vehicle models, most EV drivers will not need to charge their vehicles every night, just as few petrol and diesel car drivers need to top up every day. The National EVCI strategy states that "for many people, charging will not be needed more than once a week"[13]

Figure 8.2/2 summarises performance of different charging options for those who park on the street against four key feasibility factors. Further details of this assessment are listed in Appendix 2.

Option	Impact on streetscape & mobility	Complexity & cost	Commercial Sustainability	Scalability
Off-road fast charging hubs	Nil	Medium	High	High
Cable channels/ gullies	Medium	Medium	High	Medium
Off-road rapid &	Nil	Medium	Medium	Medium

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

super-rapid hubs				
Streetlight charging	Low	Medium	Medium	Medium
Free-standing on-street chargers	High	High	Low	Low
Rising bollards	Medium	High	Low	Low
Removable Lance	Medium	High	Low	Medium

Figure 8.2/2 – Feasibility of EV charging options for residents without off-road parking

Our priorities for supporting charging for properties without off-street parking are set out in Figure 8.2/3 below. Where possible, the Council will seek to avoid the need for on-street electrical infrastructure by creating off-road fast charging hubs within a close walking distance of residential areas with low levels of private off-street parking (e.g., driveways). When planning new developments, guidance from the Chartered Institution of Highways and Transportation (CIHT)[14] defines a reasonable maximum walking distance to a bus stop as approximately 400 metres. In the absence of detailed research on walking distances to EVCI hubs, this is the definition adopted here. This is broadly equivalent to a 5-minute walking distance.

Where off-street charging hubs are not possible, or a 400m walk is impractical due to blue badge holder status, we will prioritise use of low-impact measures, such as lamp-post chargers where these are deliverable and do not pose a trip hazard. Finally, on-street charging bollards (rising or fixed) targeted at home charging use will only be accepted where it has been shown that the alternative options are not deliverable. These will generally be slow or fast chargers only, reflecting that these facilities are intended for overnight charging in a similar way to a home driveway, rather than attracting on route or destination charge uses to residential roads.

The potential to provide safe access to charge an EV with a home charger using a cable gully or channel is currently being piloted in various locations across the UK. This has the potential to become an alternative low-impact on-street charging option, deliverable at mass scale, simply and cost effectively, in a similar way to dropped kerbs. The Council will keep this under review and consider whether such solutions would be suitable in a future revision of this strategy.

[14] 'Buses in Urban Developments' (2018)

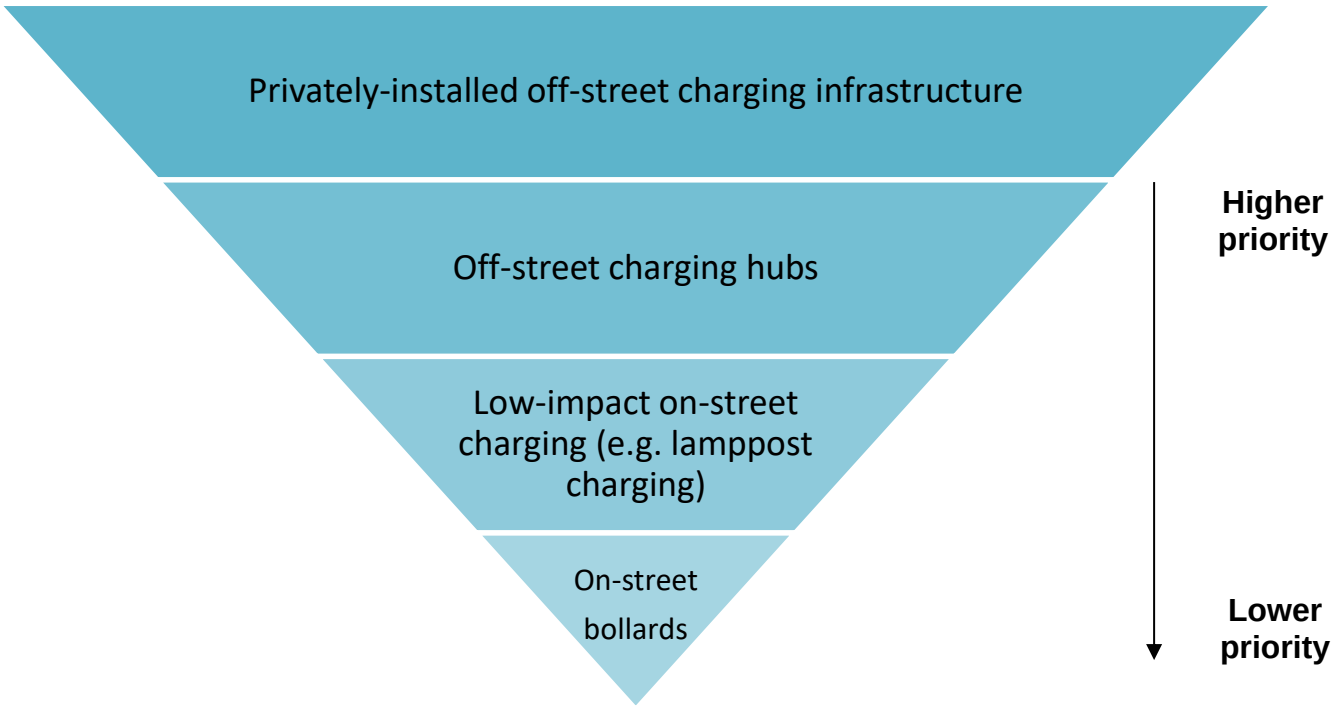

Figure 8.2/3 - Priorities for supporting charging without off-street parking

This priority matrix applies primarily to the provision of domestic charging solutions for properties without off-street charging. In the right location, on-street charging may have alternative use-cases, such as rapid charging focused on taxi vehicles, which need to be carefully considered prior to commissioning and installation. All procurement and installation of electric vehicle charge points should directly contribute to the 'Avoid, Shift, Improve' approach set out in Policy EVCI-1.

Installation of public EVCI takes significant coordination and planning, as well as financing, procurement, and delivery arrangements. Certain provisions may not be suitable in specific locations or may require costly enhancements to the energy grid. The Council will therefore not be able to deliver this infrastructure 'on demand' in response to individual requests, at least in the short term. Where 'on demand' systems have been trialled in the past, EVCI installations have proved difficult due to lengthy TROs, opposition from neighbours, DNO supply times and site selection issues. However, we will establish a web-based system to record any requests received and will use this to identify areas of high demand across the borough. This will help to inform future delivery programmes and funding bids

Policy EVCI-2:	Council-led Delivery of Electric Vehicle Charging Infrastructure

The Council will seek to enable and encourage deployment of an inclusive public Electric Vehicle Charging Infrastructure network suitable to meet predicted demand in line with national targets. Where we procure the installation of new infrastructure, we will prioritise:

- Fast chargers at key destinations such as town centres, leisure centres and other key amenities, to serve destination charging and e-car clubs.
- Slow and fast chargers in residential areas with limited off-street car parking and forecast early EV demand, to cater for overnight charging demand.
- Rapid and ultra-rapid chargers in selective town centre locations, primarily designed to serve electric taxis, fleet vehicles and e-car clubs.
- Investigation of the viability of installing appropriate EVCI at Park & Ride sites across Chester, as part of a wider strategy for the future of Chester Park & Ride.

Recognising the inherent uncertainty in the exact number of charge points needed and yet the need to rapidly increase provision, we will seek to meet or exceed regional levels of public EVCI per 100,000 population by 2025 (both total number of charge points, and number of rapid/ultra-rapid chargers) and meet or exceed the same metric nationally by 2030. This metric will include Council-led and wider provision of public EVCI within our borough.

The Council will seek external funding to ensure development of a self-sustaining EV charging network which does not rely on continuing public finance support in the future and minimises the impact on existing and future Council budgets.

Procured EVCI should be capable of using the Open Charge Point Protocol (v.1.6 or above), which is promoted as the best way to provide the widely available and accessible recharging networks of the future. This would improve functionality, reduce maintenance costs, and also allow an easier transfer of assets into any new charge operators platform if a change of supplier is required in the future.

Policy EVCI-3:	Home Charging for Properties Without Off-Road Parking

Recognising that a lack of off-road parking may be a significant barrier to EV take-up, the Council will promote a hierarchy of solutions to EV charging for residents, businesses, and shared vehicles without access to off-road parking, which prioritises off-street charging hubs within a 400-metre walking distance (approx. 5-minute walk), followed by other low-impact solutions which avoid generating additional street clutter and maintenance/ management challenges.

The Council will continue to develop our customer service process for the management and recording of requests for on-street EV charging to inform future deployment of EV charging hubs and on-street EV charging.

Fleet and workplace charging at Council sites

Sites owned by Cheshire West and Chester Council were analysed as part of a desktop review and mapped alongside existing charge points in the area (see Figure 8.2/4).

In addition to public charging, there is potential for the Council to provide charging infrastructure at their offices to encourage employee transition to EVs. Some sites owned by the Council may also be suitable for on-route charging provision for Council fleet vehicles. There may be options to facilitate public EV charging overnight at Council car parks where appropriate.

The Council is undertaking a full Fleet Review to support the Council's target of making its own activities net zero by 2030. This must be done in a careful and considered way, ensuring that the Council continues to have the right vehicles for the right jobs. This will include an innovative programme of EVCI in Council depots, car parks and on-street to enable the greening of the fleet.

We will explore opportunities for maximising public EVCI delivery by making fleet focused EVCI available for public EV charging where it is safe and practical to do so.

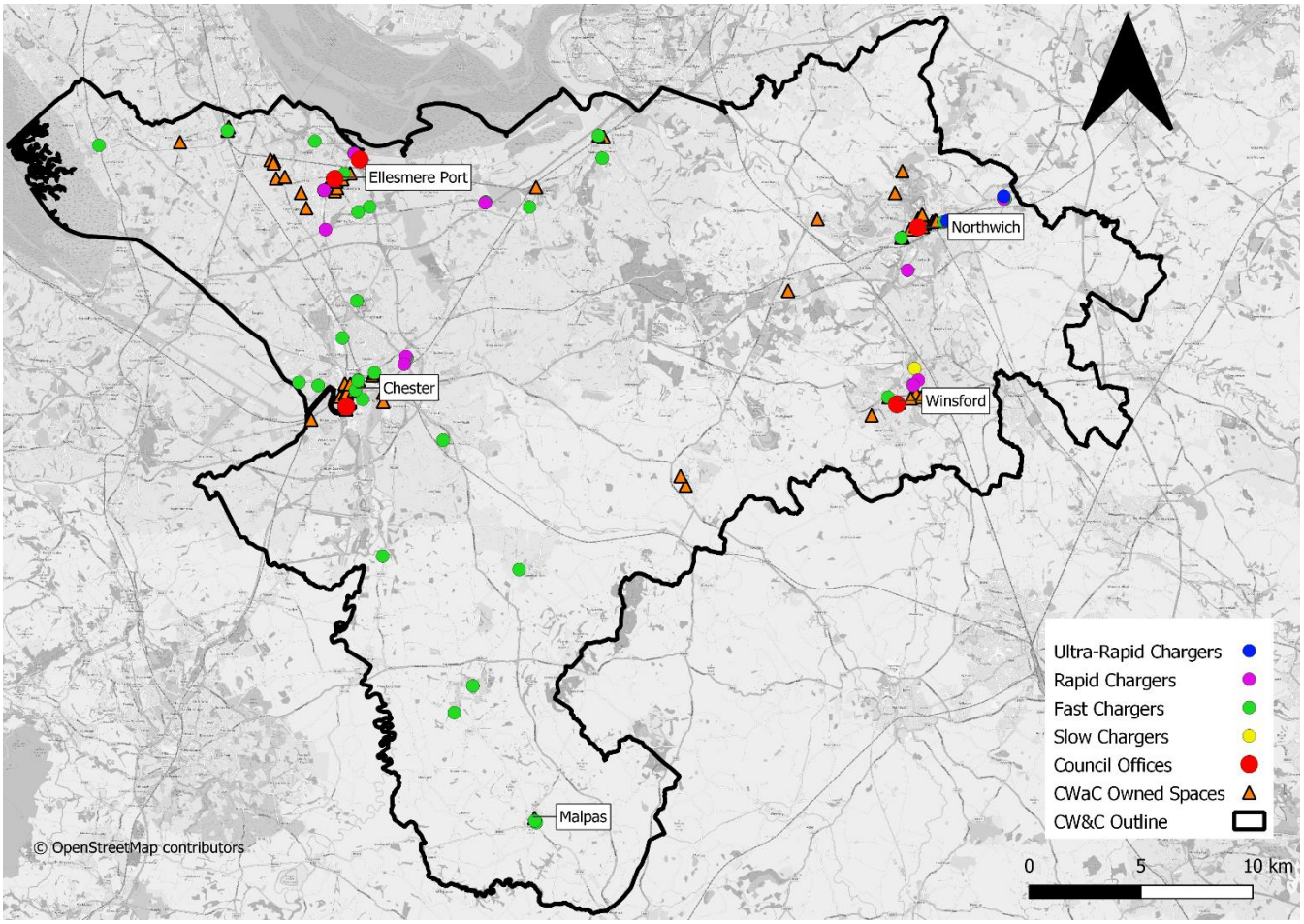

Figure 8.2/4: Council Owned Sites (Orange) and Offices (Red)

Policy EVCI-4:	Electric Vehicle Charging Infrastructure for Staff, Partners, and Fleet
The Council will support staff and visitors to access electric vehicle charging at Council premises, in line with the 'Avoid, Shift, Improve' approach as reflected in the Council's Business Travel policies. We will monitor demand for staff and contractor EV charging and seek options to provide access to charging infrastructure where necessary. We will develop staff EV charging policies to set out how staff and fleet EVCI should be used. Where technology allows, the Council will seek to transition its fleet to Ultra-Low Emission Vehicles, in line with our target to achieve net zero carbon operations by 2030. To achieve this, we will progress a systematic Fleet Review to inform the electrification of the Council's own vehicles, including exploring innovative options to support EV charging at depot sites, office car parks and at select on-street locations. We will explore opportunities to combine procurement installation and siting of fleet, workplace and public charge point infrastructure where this is practical, safe and feasible.	

9.3. Direct Influence

EV charging in new developments

Through the planning system, the Council can use its direct influence on developments to improve provision of EV charging via strategic infrastructure and transport planning, local plans, guidance, and conditions.

Local planning policies in England are guided by the National Planning Policy Framework (NPPF), which plays an important role in future proofing new developments. The planning system should help to shape places in ways that contribute to radical reductions in greenhouse gas emissions, and infrastructure to mitigate climate impacts and support renewable and low carbon energy and infrastructure. The NPPF states in paragraph 107 that:

"If setting local parking standards for residential and non-residential development, policies should take into account: a) the accessibility of the development; b) the type, mix and use of development; c) the availability of and opportunities for public transport; d) local car ownership levels; and e) the need to ensure an adequate provision of spaces for charging plug-in and other ultra- low emission vehicles."

And in 112.e that applications for development should:

"be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations"

Following a consultation in Summer 2019, the government has made changes to the English Building Regulations regarding EV charging provision in new developments, setting a new national minimum acceptable standard for new developments in a document titled Approved Document S. A summary of the requirements is set out in Figure 8.3/1 below. Please note these standards are subject to various caps and conditions, and the below is provided for illustrative purposes only.

	Requirements
New residential buildings or change of use	1 EV charge point per dwelling, capped by total number of parking spaces. Any additional parking spaces should include cable routes for future additional charge points
Major Renovations to residential buildings	1 EV charge point per 10 parking spaces, and cable routes for all additional parking spaces
New non-residential buildings and major renovations to non-residential buildings	1 EV charge point per 10 parking spaces, and cable routes for at least a fifth of the total number of remaining parking spaces
All	All charge points must be capable of providing a reasonable power output (7kw) for each parking space for which it is intended to be used, must run on a dedicated circuit and must be compatible with all vehicles which might require access to it.

Figure 8.3/1: National Requirements for EVCI in developments and renovation (Source: Approved Document S)

The Approved Document took effect on 15th June 2022 and applies to any applications submitted since that date, or before if work starts on site before 15th June 2023. As amended in 2022, the Council's Parking Standards commit to implementing the requirements set out in Approved Document S from 15th June 2023, with locally set recommended standards listed for the interim transitional period.

Policy EVCI-5:	**Electric Vehicle Charging Infrastructure in Broader Policy**
The Council will seek to include statements and policies supportive of EV charging infrastructure and, where appropriate, references to this Electric Vehicle Charging Infrastructure Strategy in future revisions of Council-published standards and guidance, including the Local Plan, the Local Transport Plan and development management standards.	

Policy EVCI-6:	**Electric Vehicle Charging Infrastructure in New Developments**
All relevant developments and renovations must deliver EVCI which meets at least national minimum Building Regulations standards from June 2023, as set out in "Approved Document S". We will explore the case for a future update of the Council's adopted Parking Standards and broader development management guidance to align with national requirements and better reflect the Council's strategic approach to transport in new developments. For the avoidance of doubt, these requirements will apply equally to developments where the Council and its partners are acting as site promotor or developer.	

In line with EVCI-1, it is not considered that the provision of EVCI will be a valid justification for additional parking spaces within a new development proposal than would otherwise be included.

9.4. Wider Influence

Commercial car parks

As identified in Section 6.2, the Council is already rapidly progressing a pipeline of planned public EVCI installations, initially focusing on off-street locations. However, the scale of change needed means that the Council cannot be responsible for delivering all the public EVCI needed to cater for growing future charging demand. Owners and managers of other car parks also need to deliver EVCI for their sites.

Public car parking at large retailers, supermarkets, shopping centres and transport hubs such as railway stations present an opportunity to provide EV charging for users of these amenities, and like car parks owned by local authorities, could provide vital support with EV charging for those unable to charge an EV at home or off-road at business premises. As set out above, many commercial organisations are installing rapid and fast charging at many of their sites.

EV charging provided by commercial organisations for their customers is a useful step towards supporting those drivers who already have access to a charger at home, but significantly greater benefits could be realised if those charger assets were made available to local people without access to off-road EV charging at home.

Communal residential car parks

Existing high-density housing developments often have communal parking areas for residents. These are usually separated from individual households, preventing residents installing home EV chargers or accessing the government's home charging grant. In some cases, housing management companies or landowners may lack the resourcing or expertise to understand how EV charging could be implemented or funded in communal car parks. The problem may be particularly acute for registered social landlords, where budgets are constrained.

Electric car clubs offer an opportunity to give wider access to clean vehicles, and reduce private car ownership in residential areas, which applies equally to both new and existing development.

Through our established relationships and partnerships, the Council will encourage and signpost owners and managers of housing stock to available and affordable options to support tenants and leaseholders with EV charging and affordable access to clean vehicles. Funding opportunities from the government may also enable future projects to take place in partnership with owners and managers of housing stock which could support resourcing at the Council to deliver this engagement and potential future projects.

NHS Hospitals

There is already a significant programme of investment planned to decarbonise the NHS, including transitioning their fleet to EVs. Visitors and staff are likely to dwell at hospitals for enough time to warrant the investment and implementation of infrastructure in hospital car parks. Additionally, charging hubs at hospitals could also support wider demands for EV

charging in appropriate locations.

NHS hospitals in Cheshire West and Chester borough were identified as part of a desktop review and plotted alongside existing charge points in Figure 8.4/1 below. This shows that there are four hospitals in total across the borough; located in Chester, Ellesmere Port, Northwich and Tarporley (War Memorial Hospital). There are no large hospital sites located to the south of the region.

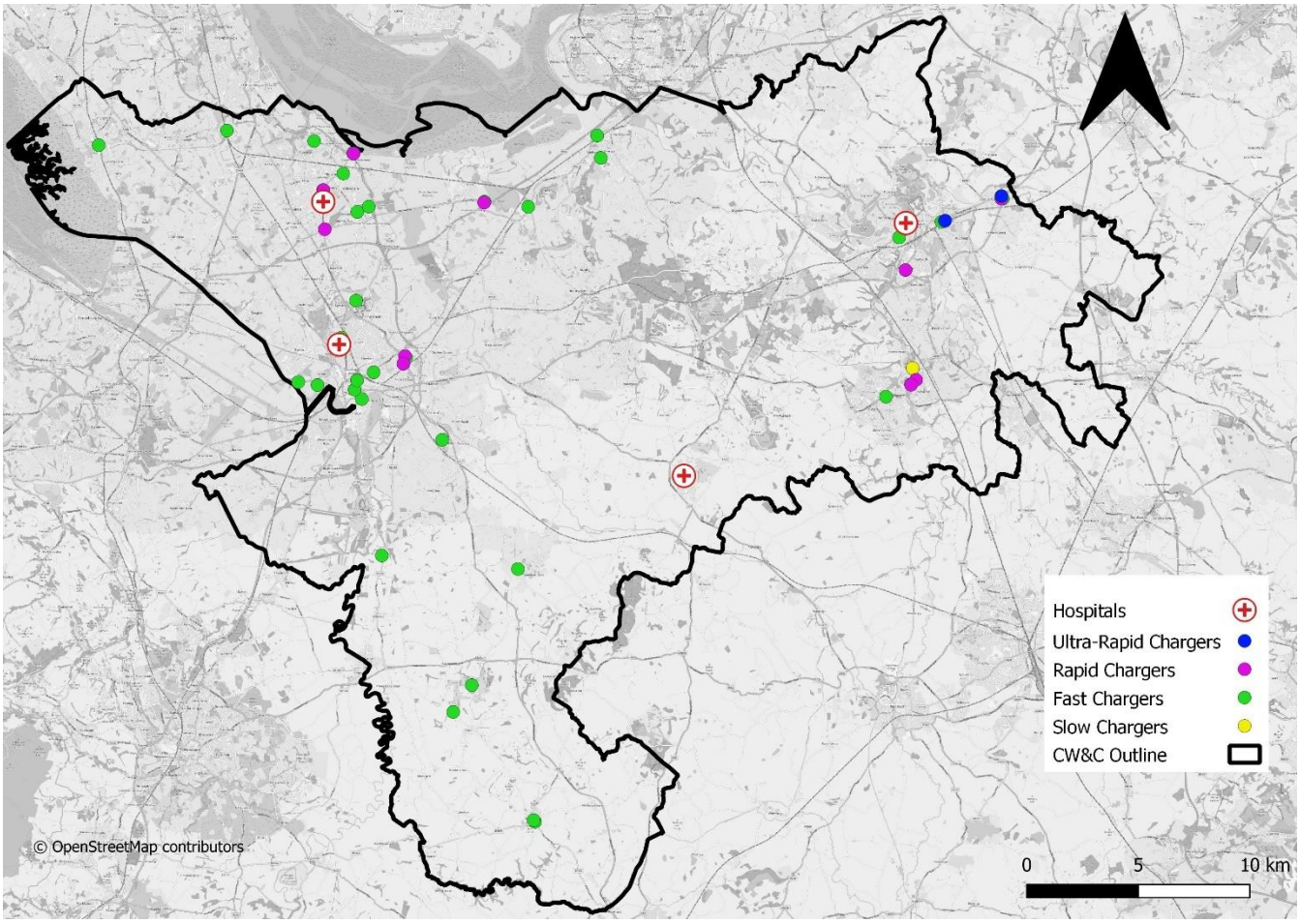

Figure 8.4/1: NHS Hospital Sites

Workplace & business charging

Workplace EV charging, provided where public and active transport are not an option, can support commuters to switch to EVs. Workplace charging can also support businesses to switch their fleets to EVs.

The Government's Workplace Charging Scheme provides a grant to support charging infrastructure at workplaces of 75% of the purchase and installation costs of a charger capped at a maximum of £350 per socket (a maximum of 40 sockets per organisation), which hundreds of companies across the UK have used to install EV chargers for their employees and fleets. The government has also legislated so that no benefit in kind liability arises for employees who charge their own EVs at work.

To further support reduction in commuter transport emissions, the Council can act to encourage employers across the borough who provide workplace parking to offer EV charging for their staff and visitors. Workplace charging can also support drivers without off-street parking at home and can enable plug-in hybrid and range extender drivers to travel further within the electric zero emissions capability of their vehicle.

Rapid charging on the strategic road network

The UK has one of the largest, and most comprehensive rapid charging networks in Europe. The government wants to encourage and leverage private sector investment to build and operate a self-sustaining public network including rapid charging. Transport for the North estimate that between 12,000 and 26,000 rapid public EV charge points will be needed along the Strategic Road Network and Major Road Network across the north of England by 2025 to meet long-distance, on-route rapid charging requirements.

The number of rapid and ultra-rapid charge points on the network has grown rapidly, with the number of ultra-rapid chargers increasing 40% nationally between in the first half of 2022.[15]

National Highways (formerly Highways England) are the responsible authority for managing the deployment of rapid EV charging at sites on the strategic road network, including the M53, M56, M6, A494, A55, and A550. There are currently only four public rapid or ultra-rapid chargers at sites on or close to the strategic road network in Cheshire West and Chester.

Cheshire West and Chester Council has an established relationship with National Highways, and with the Office for Low Emission Vehicles, and may be able to make the case for encourage deployment of rapid and ultra-rapid EVCI at sites in the borough.

As the Highway Authority for the borough, Cheshire West and Chester Council also has responsibility for highways land assets, including important link roads and associated lay-bys. Subject to funding and planning policy requirements, there may be opportunities to use some large and underutilised spaces as rapid charging stops, where grid connections and space allow.

Promoting EVs and EVCI

Given that EVs have not yet reached mass adoption stage, a broader challenge beyond public charger infrastructure is the level of information and general understanding that people have regarding EVs. Research commissioned by the Department for Transport highlights a perception that EVs do not fit well with existing parking and driving habits, but that these views are often exacerbated by low awareness, poor knowledge and some misconceptions about EV charging, costs and range.[16] The Council recognises that we can contribute towards information provision to help overcome this.

Increasing knowledge, understanding and experience of EVs can help break down the barriers to EV ownership, challenge perceptions, and give people the encouragement and reassurance they need to make the shift to a cleaner vehicle. Awareness of available EV charging infrastructure is also a factor in driving EV adoption. The Council has opportunities to use its existing online presence to signpost current and potential EV drivers toward existing sources of information on chargers, and to use resources from our projects to promote EVs and a cleaner transport choice.

A good example of challenging common misconceptions about electric vehicles can be found on the Office for Zero Emission Vehicles website[17].

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[15] https://www.zap-map.com/ultra-rapid-charging-growth-2022/

[16] Public Electric Vehicle Charging Infrastructure. Deliberative and quantitative research with drivers without access to off-street parking. Research report. (publishing.service.gov.uk)

[17] Common misconceptions about electric vehicles (accessible web version) - GOV.UK (www.gov.uk)

Policy EVCI-7:	Using the Council's Broader Influence
The Council will seek opportunities to encourage organisations, businesses and other owners of commercial public and customer car parks, including managers of housing stock and workplaces, to deploy public EV charging infrastructure where appropriate, outside the development management process. This includes working with Council-owned companies such as Brio to manage EVCI roll-out on their sites where viable. Where possible, these sites have the potential to provide benefits for local residents at times of low commercial demand, such as overnight charging. The Council will promote and support efforts to improve the availability of rapid and ultra-rapid EV charging on and near the strategic road network and important link roads across the borough, where appropriate and in line with local and national planning policy. The Council will use our existing online presence to signpost information which seeks to dispel myths about EVs and promote the potential benefits of EV transition as part of a wider sustainable mobility framework.	

10. Site Assessment – EVCI Charging Hubs

Site assessments were completed using data from a demand-led evidence base and model. The assessments primarily focus on the short to medium term, where trends in EV uptake and technological developments are more certain.

Site assessments and location recommendations are indicative only and require further assessment and appraisal, including by charge point operators, prior to installation.

10.1. Criteria for Assessment

The methodology for conducting the multi-criteria appraisal of sites is presented Figure 9.1/1 and Figure 9.1/2.

Infrastructure feasibility assessments were carried out in liaison with Scottish Power Energy Networks, the local Distribution Network Operator, and utilised their ConnectMore Tool. This indicatively shows whether each site would have a sufficient energy supply to facilitate the proposed charge points. For off-street sites, a requirement of 100 kWh power was assessed to:

- Reflect the need for rapid chargers as identified in the evidence base.
- Best practice of installing a cluster of chargers for resilience; and/ or the need for significant banks of slow/ fast chargers.

For on-street sites, assessments of 50 kWh were made to reflect:

- The constraints on installing multiple rapid chargers; and
- The fact some on-street locations would serve predominately the residential use case through a collection of 7 kWh chargers.

Further technical feasibility work would be required prior to deploying sites, including seeking budget estimate quotes from Scottish Power Energy Networks.

Classification	Sifting Criteria	Description
Off-Street Public	Capacity	Sites with a capacity under 20 spaces are removed from contention
	EV Uptake of Wider Area	Projected EV uptake of the LSOA and daily travel catchment
	Destination Charging Potential	Based on an assessment of future usage based on proximity to key facilities such as retail and employment locations
	On-Route Charging Potential	Whether the site is in close proximity to routes used by high volumes of traffic requiring top up charging
	Residential Charging Potential	The expected charging demand that would be driven from residential parking
On-Street Public	EV Uptake of Wider Area	Projected EV uptake of the LSOA and daily travel catchment

	Residential Charging Potential	The expected charging demand that would be driven from residential parking rather than on-route or destination parking

Figure 9.1/1: Sifting Criteria to identify short list

Classification	Sifting Criteria	Description
On or Off-Street Public	EV Uptake of Wider Area	Projected EV uptake of the LSOA and travel catchment.
	Destination Charging Potential	Based on an assessment of future usage based on proximity to key facilities such as retail and employment locations.
	On-Route Charging Potential	Whether the site is in close proximity to routes used by Fleet vehicles and/ or high volumes of traffic.
	Residential Charging Potential	The expected charging demand that would be driven from residential parking rather than on-route or destination parking.
	DNO Supply	Is there sufficient capacity to accommodate EV infrastructure and cost estimates.
	Commercial EV Charging Conflict	Proximity to existing charge points or anticipated future sites (e.g., nearby Shell / BP Garages, Supermarkets etc.).
	Security of Location	Review whether the location is well lit, fenced off, has barriers etc. that provides a secure location to park vehicles. Considering future improvements. Crime issues identified from data.
	Place-making conflicts	Assessment of whether delivery of infrastructure would impact on usability of footway or wider public realm.

Figure 9.1/2: Assessment criteria for 40 sites on the short list

10.2. Assessment of Potential Charging Sites

Sites that already have rapid charging infrastructure were discounted to focus this assessment on other sites that could potentially provide rapid charging to expand the existing base network. The criteria in Figure 9.2/1 were used to assign each site a score.

Criteria	Description
Place-making conflicts	Sites were scored 1-3 based on whether the delivery of EV charging infrastructure would impact on the usability of the footway or wider public realm.
Site Security	Sites were scored 1-3 for security based on factors such as lighting, fencing, security barriers, CCTV, and proximity to surrounding

	developments. Sites scoring 3 were most secure, whilst sites scoring 1 were least secure and lacked the listed security measures.
Commercial EV Charging Conflict	Sites were scored 1-3 on their potential for conflict with current and future commercial charge point investment. Sites located near current charge points, supermarkets, or close to companies with future plans for charge point investment such as Shell and BP scored lower.
DNO Supply	Following an assessment on the implementation costs for each site, sites were scored 1-3, 1 being the most costly (over £30k), and 3 being the least costly (£0-£10k).
Without Off-Street Parking	Model output scoring the site 1-3 based on the number of EVs predicted to not have access to private off-street parking i.e., those that would require some form of public charging infrastructure. Score is based on a rank between each area.
Destination Demand (Employment & Retail/ Leisure)	Model output scoring the site 1-3 based on an assessment of future destination-based usage through a review of proximity to key facilities such as employment, retail, and leisure locations.
On-Route Demand	Model output scoring the site out of 3 on whether it is in close proximity to routes used by fleet vehicles and/ or high volumes of traffic. In LSOAs that are home to key roads, the score was determined on the order of total flow on that particular road; 3 being the highest flow and 1 being the lowest. In LSOAs without a key road, a score of 1 was given.
Local EV Uptake (within 1km)	The model output for the projected EV uptake within 100m grids. Daily travel catchment calculations scored each site out of 3, 3 being high projected output and 1 being low.

Figure 9.2/1: Scoring criteria for assessing potential charge sites

Additionally, a RAG assessment for deliverability at each site was also included:

- Sites assessed as red require further work with Scottish Power Energy Networks to improve the existing connection.
- Sites assessed as amber are likely to require some reconfiguration of car parks and/ or other civils works (e.g., footway widening) to facilitate EV charging infrastructure; and
- Sites assessed as green can accommodate EV charging infrastructure, subject to further on-site assessment.

This deliverability assessment has been completed through a desktop review. This assessment should be validated through site visits and liaison with partners prior to installing EV infrastructure at any sites.

10.3. Rankings

Figure 9.3/1 presents the rankings for the shortlisted sites based on the application of the criteria in Section 9.2.

This shows that the higher scoring sites are generally concentrated around the main urban areas of Chester, Ellesmere Port, Winsford and Northwich. This is because these sites are generally located near key attractors and residential areas with limited off-street parking. A

couple of sites within the key service centres of Neston and Parkgate and Helsby also score highly due to their proximity to terraced housing/flats as well as retail and leisure facilities.

The higher scoring sites generally have spare capacity within the DNO supply to accommodate 100 kWh connections, except for Brio Leisure Centre Car Park in Frodsham. Most sites generally score well for place-making conflicts because they are off-street and have sufficient space to accommodate EV charging points. However, lower scoring sites generally have a large proportion of back-to-back parking spaces that may need to be reconfigured to accommodate EV charging points.

This prioritisation and ranking of sites is indicative only, and the list of sites is not exhaustive. It presents a starting point for network planning processes but is not a detailed implementation plan. Further assessment is required prior to EVCI procurement and installation.

Site Name	Location	DNO Supply	Residential Potential	Destination Potential	On-Route Potential	EV Uptake	Commercial Conflict	Security	Place-making Conflicts	Total	Rank	Deliverability
Garden Lane Car Park	Chester	3	3	3	3	3	3	3	2	23	1	
Brio Lifestyle Centre Car Park	Winsford	3	2	3	3	3	2	3	3	22	2	
Brio Recreation Centre Car Park	Neston and Parkgate	3	3	3	2	2	3	3	3	22	=2	
Grosvenor Park (on-street)	Chester	3	3	3	3	3	3	2	1	21	4	
Brio Ellesmere Port Sports Village	Ellesmere Port	3	2	3	2	3	2	3	3	21	=4	
Watermans Car Park	Northwich	3	3	3	3	3	1	2	3	21	=4	
Watling Street Car Park	Northwich	3	3	3	3	3	1	3	2	21	=4	
Kingsway Car Park	Winsford	2	3	3	3	3	3	1	3	21	=4	

Site Name	Location	DNO Supply	Residential Potential	Destination Potential	On-Route Potential	EV Uptake	Commercial Conflict	Security	Place-making Conflicts	Total	Rank	Deliverability
Brio Leisure Centre Car Park	Frodsham	1	3	3	3	3	3	3	2	21	=4	
Chester Road Car Park	Neston and Parkgate	3	3	3	2	3	2	2	3	21	=4	
Sandiway Library	Cuddington and Sandiway	3	3	3	3	3	2	1	3	21	=4	
Trinity Street Car Park	Chester	3	3	3	3	3	2	2	2	21	=4	
Whitby Park	Ellesmere Port	2	3	3	3	3	2	2	3	21	=4	
Frodsham Street Car Park	Chester	3	3	3	3	3	1	2	2	20	13	
Shrewsbury Road Car Park	Ellesmere Port	2	3	3	3	3	2	2	2	20	=13	
Victoria Club Car Park	Northwich	3	3	3	3	3	1	2	2	20	=13	
Hadfield Street Car Park	Northwich	3	3	3	3	2	2	1	3	20	=13	
Dene Drive (North) Car Park	Winsford	3	3	3	3	3	1	2	2	20	=13	
Frodsham Station Car Park	Frodsham	2	3	3	3	3	1	2	3	20	=13	
Moor Lane Car Park	Frodsham	3	3	3	3	3	1	2	2	20	=13	
Helsby Library	Helsby	3	3	3	2	3	1	2	3	20	=13	

Site Name	Location	DNO Supply	Residential Potential	Destination Potential	On-Route Potential	EV Uptake	Commercial Conflict	Security	Place-making Conflicts	Total	Rank	Deliverability
Helsby Quarry Local Nature Reserve	Helsby	3	2	3	3	3	3	1	2	20	=13	
High Street Car Park	Malpas	3	3	3	2	2	3	2	2	20	=13	
Community Centre Car Park	Tarporley	3	3	3	3	2	2	2	2	20	=13	
Bell Meadow Court Car Park	Tarporley	2	3	3	3	2	3	2	2	20	=13	
Tarvin Library	Tarvin	3	2	2	3	2	3	2	3	20	=13	
Delamere Street Car Park	Chester	1	3	3	3	3	3	1	2	19	26	
Marina Drive Car Park	Ellesmere Port	3	3	3	3	3	1	2	1	19	=26	
Chester Road Car Park (Little Sutton)	Ellesmere Port	3	3	2	3	3	3	1	1	19	=26	
Wellington Road Car Park	Ellesmere Port	1	3	3	3	2	1	3	3	19	=26	
Woodfield Road North	Ellesmere Port	2	3	3	3	2	2	1	3	19	=26	
Winsford Library	Winsford	3	2	3	3	3	1	2	2	19	=26	
Station Avenue Car Park	Helsby	3	2	3	2	2	2	2	3	19	=26	

Site Name	Location	DNO Supply	Residential Potential	Destination Potential	On-Route Potential	EV Uptake	Commercial Conflict	Security	Place-making Conflicts	Total	Rank	Deliverability
Neston Station Car Park	Neston and Parkgate	3	3	3	2	3	1	2	2	19	=26	
Little Budworth Country Park	Tarporley	3	2	3	3	2	3	1	2	19	=26	
Tarporley War Memorial Hospital (Off-Street Car Park)	Tarporley	3	3	3	2	2	3	2	1	19	=26	
Tattenhall Library	Tattenhall	3	2	3	3	2	3	1	2	19	=26	
Civic Centre Car Park	Ellesmere Port	1	2	3	3	3	1	3	2	18	37	
Castle Park House and Gardens	Frodsham	1	2	3	2	3	3	1	3	18	=37	
Neston Library	Neston and Parkgate	3	3	3	2	3	2	1	1	18	=37	
Tarporley Library	Tarporley	2	3	3	2	2	2	2	2	18	=37	

Figure 9.3/1: Rankings for shortlisted sites.

10.4. Indicative Implementation Plan

Based on the assessment above, an indicative implementation plan is set out in Figure 9.4/1 below, detailing recommendations for installing infrastructure to achieve a base-level EVCI network in Cheshire West and Chester. Actual installations will be subject to further site investigation, detailed assessment of electrical capacity, and (depending on procurement route) market interest. As such, other sites assessed above may come forward sooner and the timescales listed below are included as an indication of deliverability only.

Improvement Requirements	Recommended Sites	Recommended Infrastructure	Use Case	Deliverability Timescales
Provision of rapid chargers to help build a strategic base charging network.	Garden Lane Car Park, Chester	2 x 50kWh rapid chargers	Residential and Destination	2023
	Frodsham Street Car Park, Chester	2 x 50kWh rapid chargers	Residential and Destination, complementing fast chargers in adjacent Tesco	2023
	Trinity Street Car Park, Chester	2 x 50kWh rapid chargers	Residential and Destination	2023
	Watling Street Car Park, Northwich	2 x 50kWh rapid chargers	Residential and Destination	2023
	Dene Drive (North) Car Park, Winsford	2 x 50kWh rapid chargers	Residential and On Route (A54 and Council fleet)	2024
	Shrewsbury Road Car Park, Ellesmere Port	2 x 50kWh rapid chargers	Residential, supplementing existing fast chargers	2024
	Chester Road Car Park, Neston	2 x 50kWh rapid chargers	Residential and Destination and On Route	2024
	Moor Lane Car Park, Frodsham	2 x 50kWh rapid chargers	Residential and Destination and On Route	2024
	High Street Car Park, Malpas	2 x 50kWh rapid chargers	Residential and Destination and On Route	2024
	Community Centre Car Park, Tarporley	2 x 50kWh rapid chargers	Residential, On Route and Fleet	2024
	Chester Road Car Park, Little Sutton	2 x 50kWh rapid chargers, plus lighting and parking reconfiguration	Residential	2025

	Marina Drive Car Park, Ellesmere Port	2 x 50kWh rapid chargers, plus parking reconfiguration	Residential and Destination	2025
	Kingsway Car Park, Winsford	2 x 50kWh rapid chargers	Residential and Destination	2025
	Hadfield Street Car Park, Northwich	2 x 50kWh rapid chargers, plus lighting and CCTV	Residential and Destination	2025
	Grosvenor Park (on street)	2 x 50kWh rapid chargers, with parking reconfiguration and footway widening	Residential and Destination	2025
Provision of fast chargers to help build a strategic base charging network.	Watermans Car Park, Northwich	4 x 22kWh fast chargers (if not being provided by adjacent Lidl)	Destination Charging	2024
	Brio Ellesmere Port Sports Village	4 x 22kWh fast chargers	Destination Charging	2024
	Brio Lifestyle Centre Car Park, Winsford	4 x 22kWh fast chargers	Destination Charging	2024
	Brio Recreation Centre Car Park, Neston	4 x 22kWh fast chargers	Destination Charging	2024
	Frodsham Station Car Park	4 x 22kWh fast chargers – potentially also rapid if not available in nearby commercial operators	Destination Charging	2024
	Station Avenue Car Park, Helsby	4 x 22kWh fast chargers	Destination Charging	2024

	Bell Meadow Court Car Park, Tarporley	4 x 22kWh fast chargers	Destination Charging	2024
	Tarporley War Memorial Hospital	4 x 22kWh fast chargers and parking reconfiguration	Destination Charging	2025

Figure 9.4/1: Indicative Implementation Plan

11. Securing Open, Accessible, and Reliable EV Charging

11.1. Procurement of EVCI

EV charging is a developing market, and business models for successful operation of charging networks are evolving rapidly. Installing and operating EVCI requires both upfront capital and ongoing revenue funding. The bulk of capital funding is spent in the connection of the EV charger to the energy network, and remains reasonably static, while chargers themselves have significantly reduced in cost as technology has developed and demand increased. Ongoing and essential inspection and maintenance of chargers represent the bulk of revenue costs, with back-office and data connection fees taking a smaller part.

Much of the UK's charging infrastructure has been supported historically by capital grants from Government, currently administered via the Office for Zero Emission Vehicles (OZEV). However, public funding is becoming less readily available and private investors require an acceptable return on their investment, which is sometimes difficult to define in an evolving market.

There is a continuous spectrum of differing models that could be followed in delivering or expanding an EV charging network. Table outlines the key features of three models, setting out how they work and the risk implications for a Local Authority. It is important to note that although a particular commercial model might be preferred, it cannot be known if a specific model is possible in a specific area until market research and/ or an actual procurement process has been carried out. In reality, multiple commercial models could co-exist in a single Local Authority area.

Model		Description	Features/ Risk
1	In-House Management	A Local Authority selects locations, purchases charging points and keeps any revenue.	• Purchase could include installation and ongoing maintenance. • OZEV grant funding could be used for residential on-street charging points. • Potential to ensure equity through providing in areas of market failure. • Particularly appropriate for workplace and fleet installations where demand is assured. • Income for the Local Authority. • *If under-utilised, financial risk for the operation and maintenance falls on the Local Authority. Inter-operability with other provision needs to be factored in.*
2	Partnership/ Concession	A Local Authority leases public highway or off-street parking bays to private suppliers/	• Annual permit price plus possible up-front charge. • Operator selects own locations and Local Authority consults/ approves/ makes traffic order. • Local Authority may receive a small share of

		operators.	revenue from each charge point annually. • Likely to be more suitable for rapid/ fast chargers near key destinations. • Publicly owned car parks/ land could be considered under this model. • *Financial risk divested to suppliers/ operators but interested operators may be limited in some areas.*
3	Commercially Led	Private-sector suppliers use private land with limited or no Local Authority involvement.	• Rapid/ ultra-rapid charging points purchased and installed on private property (such as petrol station forecourts, private car parks, supermarkets, highway services, etc). • Requires sufficient capacity in the electricity network • Larger scale installations often require ancillary commercial uses which may not be appropriate for a particular site in planning policy terms • *No financial risk to Local Authority. However, this approach will likely lead to gaps in provision where locations are less commercially attractive.*

Table 10.1/1: Summary of EV Charging Commercial Models

Local authorities have taken various approaches to the funding and ownership of EV charging infrastructure. Initial EVCI installations were delivered using an 'in-house' model. This approach saw local authorities acting as Charge Point Operators and required significant resourcing to manage the network. However, this model left Councils with an ongoing operating cost burden without the funds to support it, causing poor reliability and availability with the associated customer dissatisfaction. Recognising this, private charging suppliers began offering to cover the operation and maintenance costs if the Council or private organisation paid the capital costs. This allowed the Council to maintain asset ownership while passing on responsibility for operation and maintenance for a fixed period, usually with the option of extension, in the supplier's contract.

A financial model developed for the Council, based on each of the options above is included in Appendix 3. This demonstrates revenue potential in the long-term, but limited returns prior to 2030, largely due to the gradual uptake of EVs. The model also assumes 100% usage, which is unlikely in the short-term. 6 charging events per day. However, if utilisation drops below this point to levels more usually indicated by market engagement, the ongoing revenue losses will be considerable, leaving the Council with significant ongoing funding commitments for several years.

The high cost of installing and managing EV charging equipment in house means that it is unlikely that Councils will be able to fund this without ongoing government funding and private investment.

Instead, the Council will pursue a partnership/ concession model, whereby local authorities can 'host' chargers operated and managed by the CPO at little or no cost to the

local authority, while revenue from charging is retained by the operator or shared with the host. The larger scale of the networks operated by commercial businesses allow them to benefit from savings in operating costs which are not readily accessible to Councils running smaller networks in-house. This model has been successfully used around the country

In instances where usage and turnover of EV charge points are low, particularly on-street EV charging in residential areas, the business case for operators is more challenging. Some capital government subsidies exist, but the business case for operators may still be less attractive where return on investment is uncertain, making it more challenging for the Council to secure externally funded EVCI.

The economics for on-street residential charging will continue to be challenging until the tipping point for EV adoption is closer, and analysis of and improvements in deployment costs, commercial models and actual asset utilisation can be assessed and addressed more fully. This may continue to require government grant funding to help de-risk EV charger deployment.

Policy EVCI-8:	**Monitoring**
The Council will establish and undertake a systematic process of monitoring utilisation rates and tariffs across EVCI within the borough, including liaison with the commercial sector, to explore potential for increased coordination and determine the optimum time to bring forward further EVCI. As EV uptake increases, monitoring usage will also allow us to provide additional charge points at or near sites of particularly high demand to reduce risks associated with drivers queuing to charge their vehicles.	

Policy EVCI-9:	**Procurement**
The Council will undertake systematic market engagement to determine the best methodology for procurement of one or more supply partners, with a view of adopting a holistic ‘strategic sourcing’ approach to provision of a full array of EVCI types across the borough – including public, fleet and workplace charging.	

11.2. Managing energy impacts

EV charging relies on energy supply through connection to networks or lighting circuits, generating challenges in connecting EV chargers and providing sufficient power to operate.

Rapid charging hubs and ultra-rapid charging take huge amounts of energy out of the grid at busy times, which can lead to expensive upgrading of the local electrical grid, including new substations or transformers. Due to their nature of delivering large amounts of energy very quickly, there is limited opportunity to manage the delivery of energy across off-peak hours to protect the grid. Even fast charger installations can require upgrades or reinforcement of networks in areas where the local network can only support small increases. The cost of these works can be prohibitive. Without managed charging, EVs

could cost £2.2 billion in UK grid infrastructure by 2050[18].

Smart charging, during off-peak periods and when demand and network congestion is otherwise low, means consumers can potentially benefit from cheaper pricing when charging, avoid triggering future network reinforcement, use their EVs to power their homes or businesses or sell energy back to the grid[19]. Since 2019 all government funded charger installations must have smart functionality

In deploying or licensing privately funded EV charging infrastructure, the Council has opportunities to require charger operators to meet the same standards set by government for smart charging. The Council also has the opportunity to guide developers deploying EV charging to opt for smart chargers though planning advice and the proposed technical advice note to be developed.

In addition, renewable energy generation and on-site storage offer even greater potential benefits for the transition to net zero transport. EVs necessarily reduce CO_2 and other harmful emissions from the tailpipe, positively benefitting the drive to reduce transport emissions. These environmental benefits can be increased if upstream carbon emissions are also tackled when EVs are charged from renewable sources. Projects across the UK have made use of battery storage, sometimes combined with on-site photo-voltaic generation, to support EV charging. The Council could increase the use of renewables in the EV charging network, and mitigate against challenges in energy supply, by promoting the installation of on-site renewable generation and storage where EV chargers are deployed in significant numbers, particularly on new development sites, and in locations that comply with local planning and design policies.

Policy EVCI-10:	**Smart Charging, Renewable Generation and Energy Storage**
The Council will seek to increase the emissions reduction benefits of electric vehicles and mitigate the impact of EVCI on the local and national grid by encouraging and promoting the use of renewable energy for EV charging, encourage ‘off-peak’ use of EV chargers, and exploring technical options to manage grid demand from EV charging infrastructure. This will include encouraging, where appropriate, the consideration of on-site renewable generation and storage infrastructure and setting parking policies which encourage the use of EVCI in Council car parks at ‘off-peak’ times.	

Policy EVCI-11:	**Engagement with the Distributor Network Operator**
Noting that the provision of cost-effective power connections will be fundamental to the delivery of charging infrastructure, the Council will continually engage and work in partnership with Scottish Power Energy Networks to address key points of weakness in the power network holding back the delivery of key EVCI programmes promoted by the Council and its strategic partners.	

[18] https://myelectricavenue.info/

[19] https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/739460/road-to-zero.pdf

11.3. Safety and Operational Considerations

There are a number of additional considerations that the Council must be mindful of when promoting or commissioning the installation of new EVCI. These include:

- Negligence liabilities – maintenance, trip hazards, duty of care typically sits with the owner of the infrastructure (unless contractually passed to another entity).
- Planning consents – most EVCI does not require planning permission, or are covered by permitted development rights, but it can apply for specific units and any proposals for associated uses or infrastructure, depending on the size, design and location, particularly in heritage, conservation and rural areas.
- Road safety – potential for drivers to be in the road while accessing a charge point, maintaining footway and cycleway widths, obstacles for visually impaired people
- Charge point positioning – some vehicles charge at the front, some at the rear and some at the side, and a charge point should be useable by all.
- Management – parking enforcement, signage, Traffic Regulation Orders, reporting faults and complaints, emergencies, inspection process, revenues.
- Disability access – charging bay, charge point, ease of access and use. BSI PAS 1889:2022 Electric Vehicles Accessible Charging contains the latest standards for accessible EVCI design and installation.

The bullet points below set out requirements for new charge point installations as detailed in the national Electric Vehicle Charging Strategy[20]. As well as underlining the points set out above, these requirements emphasise the primacy of planning for active and sustainable modes of transport in the provision of a holistic transport network based on the hierarchy set out in Policy EVCI-1:

- Charge points should not obstruct pavements or highways or present a safety risk to pedestrians.
- Cables will not be allowed to trail across the pavement unless adaptive infrastructure is provided to accommodate them safely (e.g. gullies). Anything that creates a trip hazard does not constitute adaptive infrastructure
- Charge points must be incorporated into existing street furniture or parking bays wherever possible. In circumstances where it is not possible, priority must be given to ensuring that access to, and use of, pavements is not impeded and safety of pedestrians is not jeopardised
- Parking spaces for EV charging will not be added in places where parking spaces are currently not allowed, nor where they could disrupt traffic flow, cyclists or pedestrians
- Charge point design and placement should meet accessibility standards and guidance.

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

Policy EVCI-12:	Situating Electric Vehicle Charging Infrastructure

To support Policy EVCI-1, Cheshire West and Chester Council will only support or procure installation of EVCI which:

- Do not obstruct pavements, cycleways or highways, or present a safety risk to any road users, particularly vulnerable road users. Charging infrastructure should not be located on the pavement.
- Do not require trailing cables across the pavement unless adaptive infrastructure is provided, and no trip hazard is created.
- Do not disrupt traffic flow, including for cyclists, and do not impede pedestrian movements.
- Do not introduce additional car parking where parking spaces are not currently provided or allowed.
- Avoid the creation of additional unnecessary street clutter.
- Comply with local and national planning policy.
- Meet national accessibility standards and guidelines, particularly working towards compliance with BSI PAS 1889:2022 Electric Vehicles Accessible Charging.

The planning of all installations will fully consider liabilities, planning consents, road safety implications, positioning, management and accessibility requirements in line with the latest technical standards and national best practice.

Wherever appropriate, we will use EVCI installations as an opportunity to collocate multimodal facilities, such as cycle parking and bus stop infrastructure. As part of the development of our forthcoming Local Transport Plan, we will consider the case for development of a Kerbside Policy, setting out a strategic approach of managing kerbside highway uses including EV charging, parking and quality public space.

12. Appendix 1: Geospatial Demand Model

12.1. Overview of Model

The usage potential for any charging site depends on many different factors, but the most important is the total number of EVs. This is not a static number, either spatially or temporally. Therefore, it was important to develop a model that can handle both the variation in location and the year of interest.

To understand how the public fleet will transition to EVs, the model includes a function to assess how new technology will diffuse into an existing fleet. The diffusion of the new vehicle models was governed by two important characteristics outlined below

Characteristic	Description
Rate that new vehicles are purchased	This determines the "churn" of vehicles within the overall fleet. If few new vehicles are being purchased (e.g., due to a recession), there will be a substantial reduction in the transition to EVs as the population of vehicles is not being replaced.
Probability of new vehicle purchases being an EV	If the fleet is to transition to EVs, the probability of each new vehicle being an EV should increase to 100%. This aligns with the 2030 target that has been set by the UK Government.

Income data for each Middle Super Output Area (MSOA) and the ratio of new vehicle to existing vehicle registrations was used to generate a probability of new vehicle purchases. This variable alters with income due to the strong relationship between average income and new vehicle purchase rates.

To calculate the probability of new vehicle purchases being an EV, a choice model was used. This model is a technique for providing a systematic method of choosing between multiple options, each of which may have benefits associated with it. The choice model used was a Binary Logit Choice Model, with changing variables over two alternatives. This allowed the probability of choosing between two distinct options available to the purchaser to be calculated. The general form of this model is shown below.

$$P(C_1) = \frac{\exp(\lambda U_1)}{\exp(\lambda U_1) + \exp(\lambda U_2)}$$

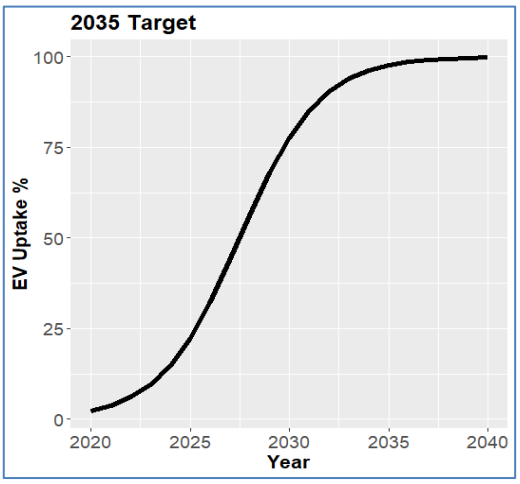
Here, C_1 represents Option 1 and U_1 represents the Utility of that choice (defined below). λ is a parameter used to determine the sensitivity to change for the utility values within the model. The utility in this case is defined through a combination of income and EV price.

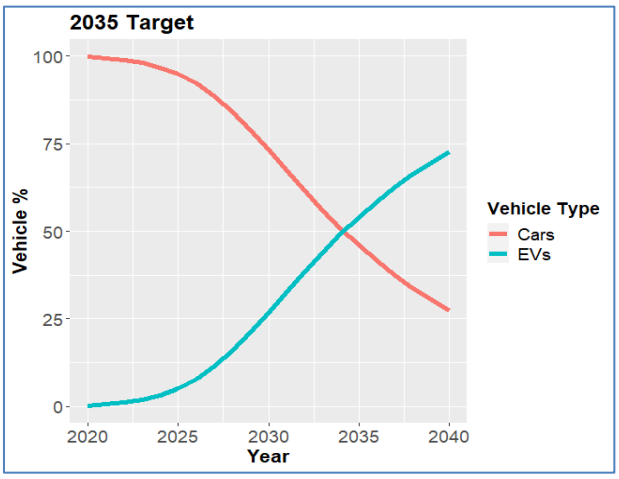
From this model, a stock flow equation was created to govern the movement of vehicles into and out of the public fleet.

$$Fleet_{2021} = Fleet_{2020} + New\ Vehicles_{2021} - Scrapped\ Vehicles_{2020}$$

The fleet in 2021 is governed by the fleet in 2020 plus all new vehicles from 2021, minus those vehicles scrapped in 2020. The new vehicles will comprise a mix of ICE and EV.

The two charts below show that the number of EVs in the fleet lags behind the 2035 target. Even though 100% of all new vehicles by 2035 will be EVs, the fleet will only contain approximately 50% EVs.





12.2. Data Review of Information Feeding into the Model

The model has been constructed, where possible, through the combination of publicly available data sets shown in the table below.

Data	Description	Use
Current EV Sales	The current EV sales by Local Authority	To determine both the current state of the EV market and also used to verify the uptake model.
Current Car Totals	The current car totals by Output Area	To disaggregate EV uptake into smaller zones.
Housing Distribution	Total numbers of houses, including housing type by Output Area	To determine the percentage of homes with off-street parking.
Income Distribution	Median income by MSOA	To determine both EV uptake percentage and the probability of purchasing a new vehicle.
Employment Distribution	Employment type by LSOA	To determine the destination charging potential using different employment types to categorise the zones.
Journey to Work OD Matrices	Survey data from MSOA to MSOA	To determine journey charging potential.
OpenStreetMap Road Network	Open-source road network	To construct a graph network of the UK which, with the journey to work matrices, is used to model long distance movements.

13. Appendix 2: Evaluation of charging options for residents without private off-road parking

Option	Streetscape & Mobility Impact	Complexity & cost of deployment	Commercial Sustainability	Scalability
Off-road fast charging hubs	Nil • Avoids street clutter	Medium • High density installations enable efficiencies • Reduced interaction with utilities and parking regulations: deployment less complex	High • Multiple charger installations enable cost savings • ORCS funding can be accessed for certain property-types. • Use by residents and car park visitors generates higher usage and income • Opportunities for private investment and concession agreements	High • Opportunities to deploy in publicly or privately owned car parks
Cable gullies / channel	Medium • Integrates well into existing streetscape • Requires footway excavation • Reliant on users feeding cable into channel – potentially dirty and with implications for disabled users • Potential for heels to get	Low • Low tech and simple: reduces costs of installation significantly • Regular cleaning of channel needed to remove leaves / detritus. May require agreement with resident • May require residents to hold public	High • Potential for self-funding by residents, similar to dropped kerbs • Low maintenance requirements mean very low ongoing costs • Potential for damage by statutory undertakers	Medium • Very few limitations on where cable gullies can be deployed • Clusters of gullies in close proximity may impact cost of footway maintenance

	caught, causing trips.	liability insurances		
Off-road rapid and ultra-rapid charging hubs	Nil • Avoids street clutter entirely	Medium • Multiple charger installations can enable efficiencies in deployment • Reduced interaction with utilities and parking regulations makes deployment process less complex • High power needs of rapid and super-rapid charging can create complexities and significant costs in securing power supply	Medium • Higher usage across groups generates greater income for operator • This is balanced by significant upfront costs for installation • Opportunities for private investment and concession or hosting agreements with landowners	Medium • Suitable sites with appropriate power supplies are challenging to secure • High numbers of rapid and super-rapid chargers generate significant challenges for local and national electrical grid
Street-light integrated charging	Low • Integrates well into existing streetscape • Limited to locations with streetlighting at kerbside	Medium • Relatively simple installation • ORCS funding can be accessed for certain property-types.	Medium • Low cost of technology and installation • CPOs moving away from concession models including maintenance	Medium • Deployment limited to areas where street-light position is at leading edge of footway • Deployment limited by lighting network capacity
Free-standing on-street charger bollards	High • Generates street clutter from charger pillar and	High • Dedicated electrical supply is required • Low density installations:	Low • Higher costs of installation and low utilisation mean that residential on-street locations	Low • Deployment limited by grid capacity and pavement width

	electrical supply cabinet • Removes space for walking and cycling modes	cost savings cannot be realised • Potential high level of maintenance/ replacement needed due to vandalism/ vehicle strikes	are less commercially viable in the near term (5-10 years) • CPOs moving away from concession models including maintenance	• Lack of commercial sustainability means operators by be reluctant to install in areas likely to see low usage without subsidy
Rising bollards	Medium • Stored below pavement surface when not in use. • Some clutter impact when in use	High • Deep excavation required, generating complexity with existing utilities and archaeological sites • Dedicated electrical supply is required • Costs are higher for installation.	Low • Higher costs of installation and low utilisation- less commercially viable in the short term • Charger operators moving away from concession models including maintenance • Additional maintenance liability to ensure raise/ lower function operates	Low • Deployment limited by grid capacity, pavement width and underground utilities • Lack of commercial sustainability means operators by be reluctant to install in areas likely to see low usage without subsidy
Removable Lance	• Low clutter when not in use. Some impact when in use • Lance may be too heavy/ inaccessible for some users	• Relatively simple installation • Dedicated electrical supply is required	• Relies on users having correct lance from correct manufacturer. • ‘Locked in’ to particular supplier	• Deployment limited by grid capacity and pavement width

14. Appendix 3: Commercial Modelling

14.1. Commercial Modelling Introduction

Integrating the modelling results with potential commercial models introduces a wide range of uncertainties. In addition to the underlying potential variation in EV uptake, the commercial viability of any model will be determined by the:

- Broadly unknowable behavioural change for future EV users; and
- Price of electricity and installation/ maintenance costs.

Whilst it is possible to determine the broad range within which such parameters may fall, there is an inherent uncertainty.

However, as an indicative exercise three separate commercial models for the installation of 10 charge points across Cheshire West and Chester was considered. The charge points are not in specified locations; but are drawn from the population charging potential at evenly spaced percentile intervals (i.e., the least commercially viable charge point to be considered would be in position 90 out of 100 charge points, the next at position 80 and so on).

In reality it is unlikely that the charge points would be so evenly distributed across the charge potential, but in some ways, this simulates the need for local authorities to provide charging infrastructure based on equality of access rather than a purely commercial assessment.

The base level of usage for a single charge point in 2021 has been derived from the usage stats provided for 2021. The average charge recorded per day, for a single site, was 4.1 kWh. This is the value that will be scaled using the predicted EV uptake values.

4.1 kWh of charge per day, sold over the course of a year at a price of £0.15/ kWh and over the cost of purchasing the electricity, would create a revenue of £225 per year. Whilst this is substantially under the cost of installing a charge point (typically at around £5,000 including scoping etc.), it is the expected growth in EVs which may make this a potentially viable revenue stream.

The total number of charge points to be installed at each site is determined through assuming that the total charging demand will scale with the expected growth in EVs, and each charge point will be able to serve a total demand determined by:

$$Total\ Energy = \ Charge\ Point\ Power \times 24 \times Max\ Utilisation$$

The Charge Point Power is determined by the power rating of the charge point (e.g., 7 kWh). 24 is the number of hours in the day and the Max Utilisation is a ratio specifying the actual number of hours which the charge point could realistically be expected to charge. For example, a charge point with a Max Utilisation of 50%, would be expected to be in use for no more than 12 hours in a day.

14.2. Commercial Models

Three distinct commercial models have been chosen for this preliminary examination:

- Model 1: Cheshire West and Chester Council installs all ten charge points across the ten sites. It is responsible for the maintenance, operating and installation costs but retains all revenue.
- Model 2: Private Companies install at the five best charge points whilst Cheshire West and

Chester Council installs the other five. Each operator is responsible for their own costs, but the Private Companies pay a commission of 10% on all profits generated from the charge points.

- Model 3: Private Companies install all ten charge points but pay a relatively modest fixed rent.

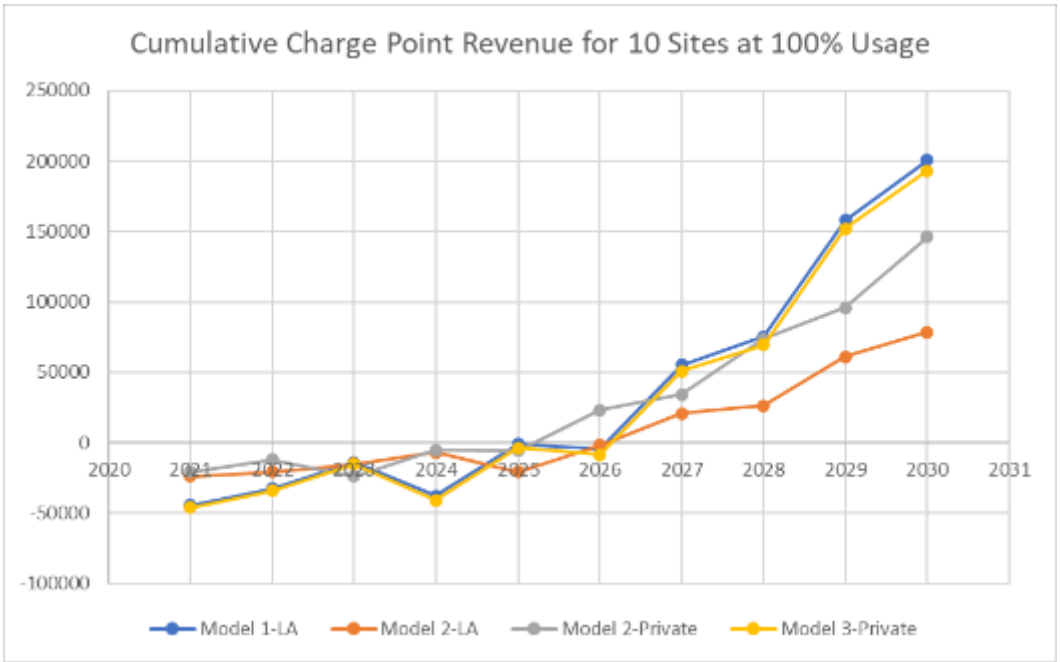
There are many other models which could be proposed. However, these three models are considered to represent a reasonable balance between Public and Private installation. The basic structure of each model is that a series of charge points are installed with the total number determined by the charging demand at each site. For this basic model, the costs are assumed to be linear with little to no efficiencies of scale in the delivery of charge points.

The cost of each charge point, and the subsequent revenue, is borne by the installing party. The exception is Model 2 where a commission is paid to Cheshire West and Chester Council from the private installers. The price per kWh (£0.15) is assumed to be constant throughout each model.

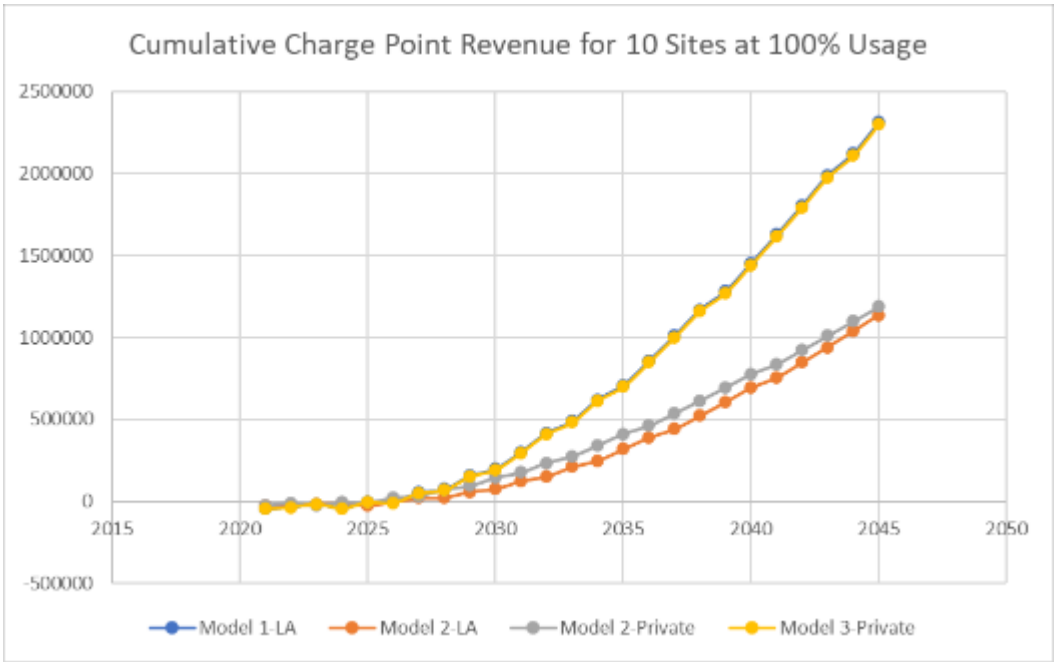
The chart below illustrates the fundamental risks involved in funding extensive EV infrastructure. Under the standard charging demand no models break even before 2025. After this point, both Model 1 and Model 3 begin to generate increasing revenue fuelled by the increasing uptake of EVs.

However, both Model 1 and Model 3 show a large initial outlay. Whilst it is expected that this will eventually be recouped, there is the risk external events may lead to a substantially reduced charging demand.

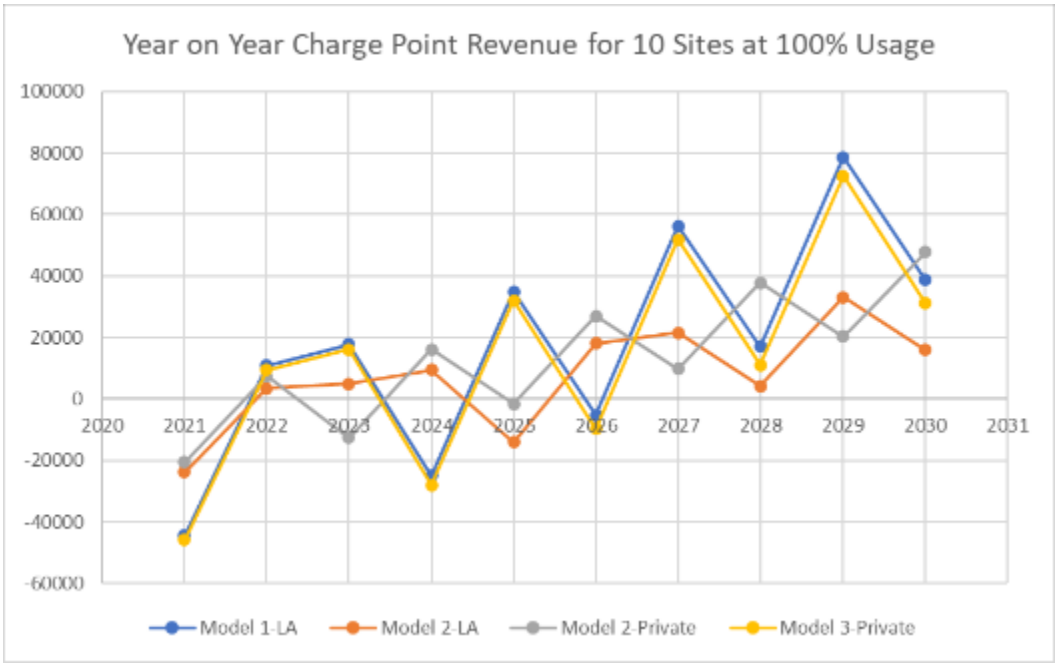
Model 2, a blended model between private and public installation, shows a much flatter revenue curve. Both private and public spend far less in the first five years, but also generate less income as the EV demand increases.



In the next chart below, the future outlook has been expanded through to 2045. At this point, the cumulative net revenue generated across the 10 different sites has increased much more steeply, leading to each site generating a healthy profit. However, it is important to note that this is based on multiple assumptions, specifically that each site may continually install charge points to keep up with demand.



In contrast, the annual revenue between 2021 and 2031 in the chart below demonstrates the major fluctuations in revenue (and hence the reduction in total cumulative revenue). This is caused by the purchase and installation of charge points.

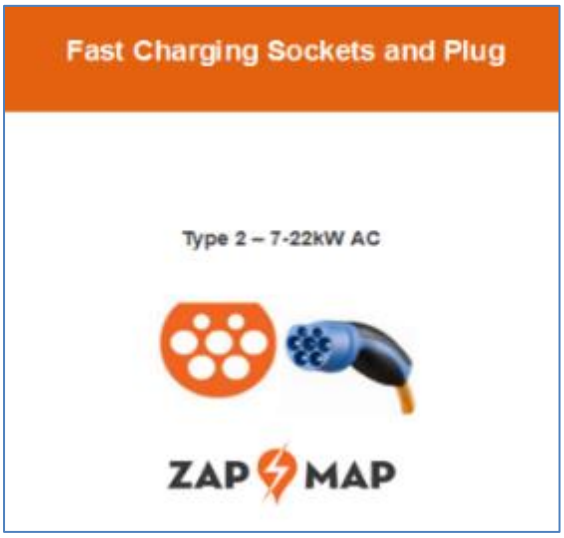


15. Appendix 4: Additional Information on Charging Connectors

PIV cars and light vans are supplied with a charging cable used to connect the vehicle to slow or fast charge points. This cable has a plug specific to the vehicle on one end, and a suitable plug on the other end to connect to slow/ fast charge points in the UK. Some vehicles have separate charging sockets for slow/ fast and rapid charging solutions, whilst some manufacturers have standardised around one vehicle-side socket for all charging solutions.

Charging cables are typically supplied with a Type 2 plug to connect to slow and fast charge points in the UK. Charging cables are also available fitted with standard UK three-pin plugs, which are intended for infrequent use where Type 2 charging solutions are not available.

Rapid and high-power chargers do not use the cable supplied with the vehicle. Instead, these chargers are fitted with tethered cables and connectors that plug directly into the vehicle due to the high power being delivered. There are four socket/ plug formats used for rapid and high-power charging in the UK. Most vehicle manufacturers use the CHAdeMO or CCS DC socket/plug for rapid and high-power charging.



(Source: Zap-Map)

16. Appendix 5: Rapid Charger Model

The below sets out the methodology used for the Rapid Charger Model referenced in this strategy.

$$Number\ of\ Rapid\ Chargers\ Required\ Per\ Day = Nv\ x\ \Pr\ x\ (\frac{Ct}{Cw})$$

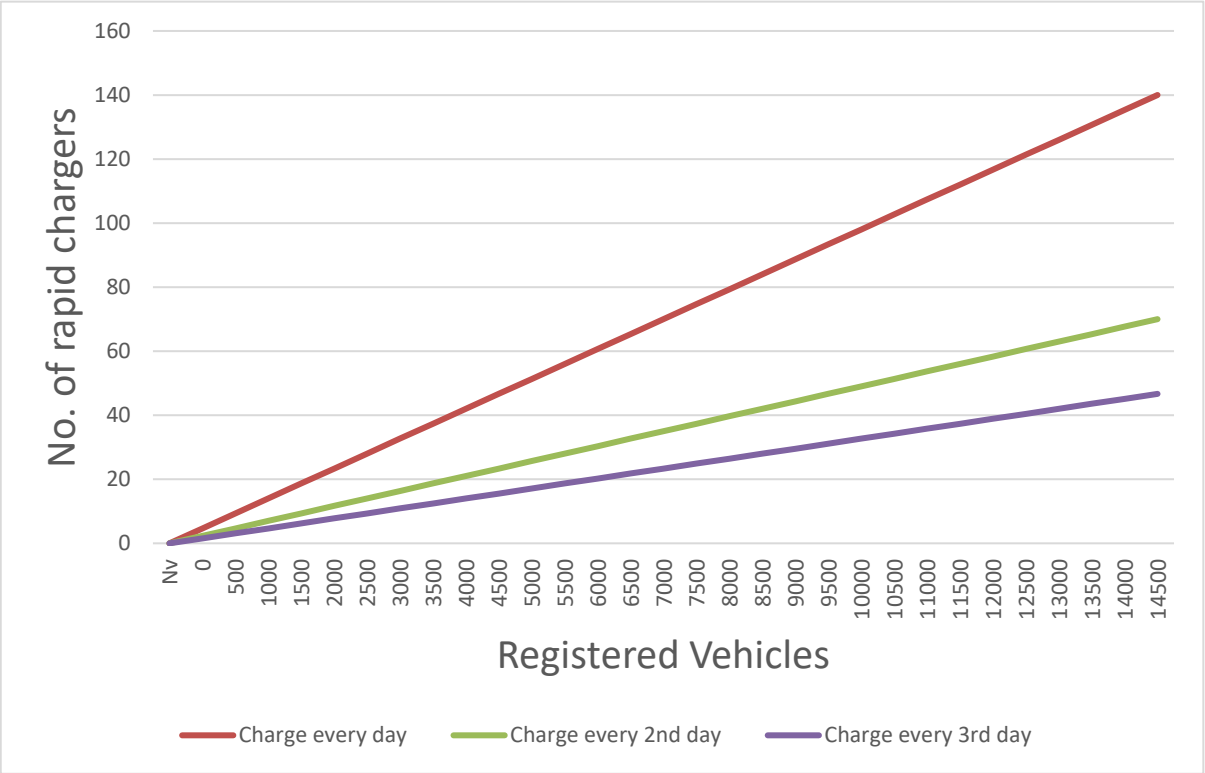
Where:

- Nv = number of vehicles expected in Cheshire West and Chester.
- Pr = The percentage predicted which may/ will use a rapid charger (20%). This is based on research that 80% of EV owners charge at home.
- Ct = The average charge time (42 minutes); and
- Cw = The charge window (the realistic window when people will use rapid chargers each day. This has been assumed as 900 minutes (15 hours) each day.

The chart below presents three scenarios from the model, which are:

- Charging every day.
- Charging every second day; and
- Charging every third day.

These scenarios have been assessed because of the uncertainty in consumer behaviour in the future. This shows that the number of required rapid chargers decreases as the frequency of charging decreases.



The range of rapid chargers required in Cheshire West and Chester for 2021, 2025, 2030, 2035, 2040 and 2045 are presented below

Future Year	Charging Behaviour Scenarios		
	Every Day	**Every Second Day**	**Every Third Day**
2021	50	25	17
2025	325	162	113
2030	828	414	289
2035	1231	615	430
2040	1496	748	522
2045	1666	833	582

This model provides estimates of the likely number of rapid chargers required to aid strategy development. However, as noted in the main body of this strategy, there are several uncertainties regarding the uptake of EVs and consumer recharging behaviour. For this reason, monitoring usage at current charge points should be conducted to understand the demand for further rapid charging facilities. The estimates in this section have been used as a contributory piece of evidence to inform strategy development and should not be used to directly underpin investment decisions and business cases.

17. Appendix 6: Transport for the North Electric Vehicle Charging Framework Data

This Appendix sets out data developed by Transport for the North as part of their Electric Vehicle Charging Infrastructure Framework. Further details can be found at https://transportforthenorth.com/major-roads-network/Electric-Vehicle-charging-infrastructure/

17.1. Electric Vehicle Uptake per 1000 Vehicles

The tables below set out TfN's projections of future EV uptake per 1000 vehicles for Cheshire West and Chester Borough, split according to EV and vehicle type, across four future scenarios. Averages have been added. Data accessed December 2022.

Car – Battery EV

	2020	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Just About Managing	480	440	490	620	740	820	850
Digitally Distributed	480	440	660	780	840	850	850
Prioritised Places	480	360	540	690	780	830	850
Urban Zero Carbon	480	540	690	780	840	850	850
Average	**480**	**445**	**595**	**717.5**	**800**	**837.5**	**850**

Car – Plug-in Hybrid EV

	2020	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Just About Managing	460	430	380	250	130	45	8.6
Digitally Distributed	460	430	210	94	32	6.4	0
Prioritised Places	460	510	330	180	83	27	4.3
Urban Zero Carbon	460	330	180	88	31	6.4	0
Average	**460**	**425**	**275**	**153**	**69**	**21.2**	**3.225**

Van – Battery EV

	2020	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Just About Managing	40	59	69	87	110	120	130
Digitally Distributed	40	59	94	110	120	120	130

Prioritised Places	40	48	78	95	110	120	130
Urban Zero Carbon	40	74	97	110	120	120	130
Average	**40**	**60**	**84.5**	**100.5**	**115**	**120**	**130**

Van – Plug-in Hybrid EV

	2020	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Just About Managing	0	53	53	33	16	7	2.3
Digitally Distributed	0	55	27	12	4.5	1.8	0
Prioritised Places	0	65	44	24	11	4.7	1.1
Urban Zero Carbon	0	42	24	11	4.4	1.8	0
Average	**0**	**53.75**	**37**	**20**	**8.975**	**3.825**	**0.85**

HGV – Battery EV

	2020	**2025**	**2030**	**2035**	**2040**	**2045**	**2050**
Just About Managing	25	8	7.4	8.8	11	13	15
Digitally Distributed	25	10	8.6	9.4	11	13	15
Prioritised Places	25	12	9.3	10	11	13	15
Urban Zero Carbon	25	8	7.4	8.8	11	13	15
Average	**25**	**9.5**	**8.175**	**9.25**	**11**	**13**	**15**

17.2. EVCI Requirements

The tables below set out TfN's projection of the number of EV charge points needed to meet future charging demand within Cheshire West and Chester Borough, split according to charge purpose/location, across four future scenarios. In some tables, data is also split by two 'user preference' scenarios, one of which shows an increased level of destination-focused charging. Averages have been added. Data accessed December 2022.

Destination

		2020	2025	2030	2035	2040	2045	2050
Just About Managing	Baseline	10	210	730	1100	1200	1100	980
	Destination	25	500	1700	2700	3100	2900	2700
Digitally Distributed	Baseline	10	300	660	930	980	970	950
	Destination	25	720	1700	2500	2700	2700	2600
Prioritised Places	Baseline	10	270	690	980	1000	950	910
	Destination	25	640	1700	2500	2700	2600	2500
Urban Zero Carbon	Baseline	10	360	710	940	940	930	940
	Destination	25	870	1800	2500	2600	2600	2600
Average	Baseline	10	285	697.5	987.5	1030	987.5	945
	Destination	25	682.5	1725	2550	2775	2700	2600
	Combined	17.5	483.75	1211.25	1768.75	1902.5	1843.75	1772.5

HGV Depot

		2020	2025	2030	2035	2040	2045	2050
Just About Managing	All	24	160	190	660	840	930	930
Digitally Distributed	All	24	160	190	660	850	950	980
Prioritised Places	All	24	160	180	620	780	850	850
Urban Zero Carbon	All	24	160	180	620	790	870	870
Average	All	24	160	185	640	815	900	907.5

Home

		2020	2025	2030	2035	2040	2045	2050
Just About Managing	All	1100	15000	58000	110000	150000	170000	180000
Digitally Distributed	All	1100	22000	69000	120000	160000	170000	180000
Prioritised Places	All	1100	18000	64000	120000	150000	170000	180000
Urban Zero Carbon	All	1100	28000	80000	130000	160000	170000	180000
Average	All	1100	20750	67750	120000	155000	170000	180000

Public Residential

		2020	2025	2030	2035	2040	2045	2050
Just About Managing	Baseline	23	480	1600	2600	2900	2700	2600
	Destination	18	360	1300	2000	2300	2200	2100
Digitally Distributed	Baseline	23	670	1600	2300	2600	2700	2600
	Destination	18	520	1200	1900	2100	2100	2100
Prioritised Places	Baseline	23	590	1600	2400	2600	2500	2500
	Destination	18	460	1300	1900	2100	2100	2100
Urban Zero Carbon	Baseline	23	800	1700	2400	2500	2500	2500
	Destination	18	640	1400	1900	2000	2000	2000
Average	Baseline	23	635	1625	2425	2650	2600	2550
	Destination	18	495	1300	1925	2125	2100	2075
	Combined	20.5	565	1462.5	2175	2387.5	2350	2312.5

Workplace

		2020	2025	2030	2035	2040	2045	2050
Just About Managing	All	12	190	640	980	1100	950	870
Digitally Distributed	All	11	260	580	840	910	890	880
Prioritised Places	All	11	230	610	860	890	830	790
Urban Zero Carbon	All	11	310	620	830	820	820	830
Average	All	11.25	247.5	612.5	877.5	930	872.5	842.5

17.3. Potential on-route rapid charging locations (2025-2050)

17.4. Potential on-route rapid charging locations per LA (2025-2050)