

local transport projects 

traffic engineering and transport planning

Conwy County Borough Council

**Electric Vehicle
Chargepoint Strategy**

June 2024

Armstrong House,
The Flemingate Centre,
Beverley,
HU17 0NW

📞 01482 679 911

✉️ info@ltp.co.uk

🌐 www.local-transport-projects.co.uk

Registered No. 5295328

Conwy County Borough Council

Electric Vehicle Chargepoint Strategy

June 2024

Client Commission

Client:	Conwy County Borough Council	Date Commissioned:	November 2023
---------	------------------------------	--------------------	---------------

LTP Quality Control

Job No:	LTP/23/5682	File Ref:	Conwy EV Chargepoint Strategy (Final Issue 1A)		
Issue	Revision	Description	Author	Checked	Date
1	A	Minor Amendments	KB	NW	19/06/2024
1	-	Final Issue	KB/JH	NW	17/04/2023
Authorised for Issue:				NW	

LTP PROJECT TEAM

As part of our commitment to quality the following team of transport professionals was assembled specifically for the delivery of this project. Relevant qualifications are shown and CVs are available upon request to demonstrate our experience and credentials.

Team Member	LTP Designation	Qualifications
Nigel Wilson	Technical Director	CEng FICE MCIHT FIHE
Jack Hearnshaw	Principal Transport Planner	BA(Hons) MIHE
Katy Bentley	Transport Planner	BSc(Hons) MIHE

The contents of this document must not be copied or reproduced, in whole or in part, without the written consent of Local Transport Projects Ltd.

CONWY COUNTY BOROUGH COUNCIL

ELECTRIC VEHICLE

CHARGEPOINT STRATEGY

CONTENTS

1.	INTRODUCTION	3
1.1	Background	3
1.2	Purpose & Outcomes	3
1.3	Structure of Report	4
1.4	Glossary	5
2.	POLICY CONTEXT	6
2.1	Welsh Policy	6
2.2	Conwy County Borough Council Policy	8
2.3	Wider UK Policy	9
2.4	Other Relevant Policies & Strategies	11
3.	OPTIONS FOR DELIVERING & OPERATING EVC	12
3.1	Off-Street Charging Provision	12
3.2	On-Street Charging Provision	12
3.3	Hub Charging	15
3.4	Types of EVCs	15
3.5	Plug Technology	16
3.6	Charging Costs	17
3.7	Range Anxiety	18
3.8	Sustainable Power Sources	18
4.	EXISTING SITUATION	20
4.1	EV Registrations in Conwy	20
4.2	EV Chargers in Conwy	22
4.3	Publicly Available Off-Street Car Parks	23
4.4	Household Composition	24
4.5	Travel Demand – Local	25
4.6	Travel Demand – Commuting	25
4.7	Travel Demand – Tourism	26
4.8	Existing Taxis & PHVs in Conwy	28
5.	FORECAST FUTURE REQUIREMENTS (2024-2030)	29
5.1	EV Growth Scenarios	29
5.2	EVC Requirements	31
6.	PROPOSED EVC STRATEGY OBJECTIVES	34
6.1	Proposed EVC Strategy Objectives	34
7.	EVC MANAGEMENT MODELS	35
7.1	EVC Management Model Options	35
7.2	Own & Operate	36
7.3	Lease & Operate	37
7.4	Concession Agreements	37
7.5	Risk vs Reward vs Flexibility	39
7.6	Car Park Operations	40
7.7	EVC Model Appraisal	41
7.8	Procurement	41
8.	PROPOSED EVC OPERATION	43
8.1	Potential Off-Street EVC Locations	43
8.2	Potential On-Street EVC Locations	46
8.3	Charging Hubs	47
8.4	Potential Electric Taxi/PHV EVCs	48
9.	RECOMMENDATIONS & IMPLEMENTATION PLAN	50
9.1	Recommendations	50

9.2	Proposed Implementation Plan	51
10.	REFERENCES	53

APPENDICES

Appendix 1 – Registered and Forecast EVs
Appendix 2 – Current EVCPs
Appendix 3 – Existing Car Park Analysis
Appendix 4 – Household Composition
Appendix 5 – Origin Destination Data
Appendix 6 – Extracted Tourism Data
Appendix 7 – Projected Off-Street EVC Requirements 2025-2030

TABLES

Table 1: Glossary of Terms	5
Table 2: On-Street Charging Provision Types	14
Table 3: EVs Registered in Conwy & Wales	21
Table 4: Existing EVCs	22
Table 5: Workplace Journey Length	26
Table 6: Existing Projected EVs and Total Vehicles in Conwy	29
Table 7: Potential Off-Street EVC Requirement	31
Table 8: Potential On-Street EVC Requirement	32
Table 9: Own & Operate Model – Benefits & Disbenefits	36
Table 10: Lease & Operate Model – Benefits & Disbenefits	37
Table 11: Fully Funded Concession Agreement Model – Benefits & Disbenefits	39
Table 12: Partially Funded Concession Agreement Model – Benefits & Disbenefits	39
Table 13: Appraisal of EVC Management Options Against Strategy Objectives	41
Table 14: Example Concession Model Projects	42
Table 15: Short Stay/Long Stay Analysis and EVC Type	43
Table 16: Proposed Off-Street EVC Provision (2025)	45

FIGURES

Figure 1: Charging Types & Speeds	16
Figure 2: Fast Connectors	17
Figure 3: Rapid Connectors	17
Figure 4: EVs Registered in Wales 2012-2023 Q3	20
Figure 5: EVs Registered in Conwy 2012-2023 Q3	20
Figure 6: Tourism Numbers in Conwy	27
Figure 7: Seasonal Profile	28
Figure 8: 'Leading the Way' EV Uptake	30
Figure 9: EVC Management Models: Risk vs Reward vs Flexibility	40
Figure 10: Approach to Taxi/PHV EVCs	49
Figure 11: Proposed Implementation Plan Programme (FY24/25 & FY 24/26)	51

I. INTRODUCTION

I.1 Background

- 1.1.1 Local Transport Projects Ltd (LTP) has been commissioned by Conwy County Borough Council (CCBC) to develop an Electric Vehicle Chargepoint (EVC) Strategy for Conwy.
- 1.1.2 Conwy is a diverse county, covering an area of 1,130 square kilometres, situated in North Wales. Conwy had an estimated population of 118,200 people in 2020 and is a largely rural county, with 38% taken up by Snowdonia National Park. Tourism forms a major part of Conwy's economy, with 9.5 million visitors in 2022.
- 1.1.3 CCBC declared a climate emergency on the 9th May 2019, and has developed a decarbonisation plan to become a net zero local authority by 2030. Additionally, CCBC has established a Climate Challenge Programme to deliver its target to achieve net zero carbon emissions. Following on from the Welsh Government setting out a legal commitment to the delivery of Wales' target of Net Zero by 2050 (WG, 2021a).
- 1.1.4 Although the scope of the net zero commitment is limited to emissions from its own estate and operations, the Council has the potential to play a wider leadership and advocacy role to promote behavioural change and reduced carbon emissions by the community. A Public EV Charging Project and Local Area Energy Plan (LAEP) are therefore part of the Climate Challenge Programme. The LAEP (CCBC, 2022) includes development of public EV charging infrastructure as one of 7 priority intervention areas.
- 1.1.5 The North Wales Local Transport Plan (NWLTP) for Conwy has been jointly developed by the Corporate Joint Committee (CJC), which includes representatives from the six North Wales Local Authorities, including Conwy County Borough Council, Denbighshire County Council, and others. This North Wales Joint Local Transport Plan outlines an objective to provide, promote and improve sustainable forms of transport and infrastructure to minimise the negative impacts of transport on the local and global environment.
- 1.1.6 The provision of EVC is an essential component of reducing carbon footprint and supporting the Climate Change programme. It also responds to the rapid increase in the number of electric vehicles on the road, and the proposed ban of the sale of new petrol and diesel cars and vans by 2035.

I.2 Purpose & Outcomes

- 1.2.1 The purpose of the EVC strategy is to:
 - Support CCBC's response to the Welsh Government's Electric Vehicle Charging Strategy for Wales of March 2021, the vision for which is that: 'By 2025, all users of electric cars and vans in Wales are confident that they can access electric vehicle charging infrastructure when and where they need it'.

- Identify how CCBC may directly increase public access to EVCs within the Local Authority area through the provision of EVC infrastructure in CCBC operated car parks (i.e. off-street and council workplaces), on the adopted public highway (i.e. on-street), for Taxis within the public realm and through the potential creation of charging hubs.
 - Provide a 'blueprint' for implementing, managing and maintaining EVC in the foregoing locations over the next 6-years (i.e. 2024-2030).
- 1.2.2 In terms of outcomes, the CCBC brief for the development of the EVC strategy seeks a comprehensive report setting out the strategic approach to public EVC provisions by CCBC including:
- Management model – Own and Operate v Concession model or a middle ground
 - Maintenance and management, including management of bay usage
 - Off and On-street charging provision – challenges, management, current demand, future demand
 - Taxi operator provisions- car park, on-street, taxi rank
 - Payment methods – fully accessible payment methods, apps
 - Charging costs – charge rates, projected income and operational costs (outgoings)
 - Future predictions on uptake of EVs – identify high growth areas. priority
 - Charging Hubs - feasibility, potential locations
 - Alternative power sources - Solar hubs etc

1.3 Structure of Report

- 1.3.1 Following this introduction, this Electric Vehicle Chargepoint Strategy report is divided into eight further sections as follows:
- **Section 2** – reviews national and local policy in relation to EVC.
 - **Section 3** – provides an overview of the options for delivering and operating EVC in Conwy.
 - **Section 4** – provides a review of the existing situation in relation to EVs, EVCs, off-street parking, access to charging facilities, travel demand and public perceptions of EVC.
 - **Section 5** – provides an assessment of future EVC requirements in Conwy for the period 2024-2030.
 - **Section 6** – identified the proposed strategic objective for EVC in Conwy.
 - **Section 7** – provides an overview of management models for operating EVC in Council car parks and on-street together with an appraisal against the proposed EVC objectives for Conwy.
 - **Section 8** - identifies the potential scope and scale of EVC operation in Conwy to meet the EVC objectives.

- **Section 9** – provides a proposed implementation plan for delivering the proposed EVC strategy for Conwy.

1.4 Glossary

1.4.1 A glossary of terms frequently referenced within this report is as below:

Table 1: Glossary of Terms

Term	Explanation
BEV	Battery Electric Vehicle
CCBC	Conwy County Borough Council
DNO	Distribution Network Organisation
EV	Electric Vehicle
EVC	Electric Vehicle Chargepoint
LA	Local Authority
PHEV	Plug-In Hybrid Electric Vehicle
SLA	Service Level Agreement

2. POLICY CONTEXT

2.1 Welsh Policy

Electric Vehicle Charging Strategy for Wales (WG, 2021a):

- 2.1.1 The strategy sets out a vision electric vehicle charging in Wales and the steps that the Welsh Government will take to support better charging infrastructure across Wales. The Welsh Government is proposing to invest approximately £30m in electric vehicle charging over the next five-year period to kick start delivery. This strategy also outlines the current situation regarding EV ownership and associated infrastructure in Wales, with 105 EVs licensed per 100,000 of population (2020) and 21 EVCs per 100,000 of population (2020). There are approximately 320 workplace chargers installed in Wales, at least 145 on-street chargers, approximately 300 destination chargers at around 150 locations and approximately 130 rapid chargers at 70 'on-route' locations.
- Based on the scenarios modelled for EV uptake, the following conclusions are made to be taken forward in action planning:
 - The need for a substantial increase in the number of slow, fast, and rapid/ultra rapid chargers available in Wales. Meeting the need of 55,000 fast chargers in the Wales, alongside home charging, will be a key area of focus.
 - The need for better quality charging, to improve the user experience for electric cars and vans desirable quality outcomes include contactless debit/credit card payment and associated app-based system, information about charging on main roads to help drivers choose where/ when to charge, reliable infrastructure with high availability and clear pricing information.
- 2.1.2 An Action Plan from the strategy was published in October 2021, with the Welsh government recognising its enabling role in delivering this charging infrastructure through the use of regulatory and planning levers, land use planning guidance, use of public land and resources, funding, and targeted support programmes.
- 2.1.3 A report by the Welsh Parliament Climate Change, Environment, and Infrastructure Committee into the progress made towards achieving the targets of the Action Plan was published in March 2023 and noted a lack of progress on EVs. The report provides a roadmap for improving EV infrastructure across Wales, including 21 recommendations.
- 2.1.4 The key targets in terms of EV charge point infrastructure in both Wales and Conwy are as below:
- The provision of one public charge point for every 7 to 11 electric vehicles on the road by 2025. As adoption increases these numbers rise proportionately to approximately 25 vehicles per charge point; and
 - On-street charging and in car parks will be encouraged in villages, towns and cities throughout Wales; with a view to installing on average one charge point for one in every three electric vehicles that cannot charge at home.
- 2.1.5 The 'Electric Vehicle Charging Strategy for Wales' (WG, 2019) identifies a total of 6 charging options:

- **Home charging:** *'Home charging is the cheapest and most convenient form of charging, usually slow charging overnight';*
- **Workplace charging:** *'Workplace charging is typically provided in private car parks. Charging can be slow or fast and offers a convenient way to recharge an electric vehicle for employees and business fleet';*
- **On-street charging:** *'Stand-alone pillars, typically 'fast' chargers provide on-street charging. Dedicated kerbside charging points have been developed that avoid cables trailing across footways';*
- **Destination charging:** *'Fast charging is provided at destinations where the user may park for a number of hours, e.g. gym, cinema or shopping centres. Hotel chains may take advantage of the overnight charging, and use slow charging as it is more cost-effective';*
- **On-route charging:** *'On-route charging is used to top up midway through a journey, for example at motorway service areas';*
- **Hub charging:** *'Hub-based charging can be at centralised or out-of-town locations. Hubs can include different types of users, as part of a multi-modal transport strategy. A mix of charging types would be required to service different user needs. There is the potential for synergies to offer greater value.'*

Net-Zero Strategic Plan (WG, 2022):

- 2.1.6 This document sets out the strategy for the Welsh Government to lead by example and achieve net zero as an organisation by 2030. Accelerating the rollout of EV charging infrastructure constitutes a specific component in the route map to achieve net zero greenhouse gas emissions by 2030 in the public sector. The route map identifies the following three phases of action for achieving net zero ambitions by 2030:
- *'Moving up A Gear'* (2021-22) – understanding the context and what needs to be done and where action need to accelerate.
 - *'Well on our way'* (2022-26) – where there is an expectation that low carbon is becoming the norm and the Welsh Public Sector are definitely on the way to net zero status.
 - *'Achieving our goal'* (2026-30) – where choosing zero carbon has become routine, culturally embedded, and self-regulating.
- 2.1.7 Under the Corporate Fleet initiative, the Welsh Government will support expanding the electric vehicle rapid charging across all its sites. The government will accelerate the transition to EV, though recognise that progress in part depends on the deployment of EVCs between now and 2030.

Llwybr Newydd: The Wales Transport Strategy (WG, 2021b):

- 2.1.8 This strategy includes a commitment to deliver the Electric Vehicle Charging Strategy (WG, 2021a) and encourage the use of motorbikes and powered light vehicles instead of cars where there are no other transport choices. The Roads, Streets and Parking mini-plan identifies an ambition to ensure that EV and electric bike charging facilities are readily available throughout Wales.

Planning Policy Wales Edition 10 (PPW10) (WG, 2018):

- 2.1.9 This document notes that new non-residential developments in Wales are to have EV charging points for at least 10% of the parking spaces available, although there do not appear to be similar standards for residential developments.

Welsh Building Regulations:

- 2.1.10 It is understood that it is intended to transpose the revised '*The Energy Performance Buildings Directive*' (EC, 2023) into Welsh Building Codes, which will require all new homes and refurbished homes to have all parking spaces ready for EV charging.

2.2 Conwy County Borough Council Policy**Conwy's Local Area Energy Plan (CCBC, 2022)**

- 2.2.1 The LAEP for Conwy presents a vision for a net zero local energy system in Conwy together with a summary of evidence to support the vision, and a route map to get there. The vision for Conwy's future local energy system includes a priority intervention to develop public EVC infrastructure, including up to 150 rapid and 2,000 fast chargers by 2030 based on the Electric Vehicle Charging Strategy for Wales (WG, 2021a).
- 2.2.2 The LAEP outlines three key actions on delivering public EV charging infrastructure, including:
- 1) To publish an EV Strategy/Approach;
 - 2) To install charging points in council offices and car parks; and
 - 3) To transition Conwy County Borough Council owned fleet of vehicles to electric.

Conwy's Decarbonisation Plan (CCBC, 2019a)

- 2.2.3 Following the CCBC's declaration of a climate emergency in 2019, this document sets out the strategy to becoming a net zero authority by 2030. This will be delivered through the Climate Challenge Programme. Following actions are to be taken:
- Define scope of activities and emission sources to be included in the programme.
 - Calculate the baseline emissions to be used as the start of the journey to net zero.
 - Model the scenarios which will achieve the highest carbon reduction.
 - Deliver projects within the Climate Challenge Programme.

Climate Challenge Programme (CCBC, 2019b)

- 2.2.4 Following the Climate Emergency Declaration in May 2019, CCBC set up the Climate Challenge Programme to deliver the vision to lead communities in delivering a net zero county. The programme objectives are to:
- Reduce greenhouse gas emissions from the CCBC estate, fleet, staff commuting business travel, supply chain and street lighting to achieve the net zero emissions.
 - Offset and remaining emissions by 2030.
 - Develop and implement a local area energy plan for Conwy County by 2030.

Conwy County Council Local Development Plan 2018-2033 (CCBC, 2019c)

- 2.2.5 The plan embraces sustainable development and the concept of placemaking and embeds the spirit of the well-being of future generations act to take positive steps to creating sustainable places, social inclusion, and improved well-being for all in Conwy. Under the Sustainable transport and accessibility policy, the provision of the Ultra Low Emission Vehicles (ULEVs) and charging points will be encouraged and supported through the Local Development Plan (LDP) as part of new development. Where car parking is provided for new non-residential development, the LDP will seek a minimum of 10% car parking spaces to have ULEV charging points.

2.3 Wider UK Policy

The Electric Vehicle Infrastructure Strategy (DfT, 2022):

- 2.3.1 This strategy sets out the vision and action plan for the rollout of electric vehicle charging infrastructure in the UK, ahead of the phase-out dates. The strategy aims to end the sale of new petrol and diesel vehicles by 2030 (subsequently revised to 2035) and for all new cars and vans to be fully zero-emission at the tailpipe by 2035. The strategy also focuses on installing more on-street EVCs, providing convenient and affordable charging, ideally on the street where people live.

Regulations: Electric Vehicle-Smart Charge Points (DESNZ, 2021):

- 2.3.2 The Electric Vehicles (Smart Charge Points) Regulations 2021 is a set of regulations made using powers in the Automated and Electric Vehicles Act 2018. The regulations ensure that EVCs sold in Great Britain for private (domestic or workplace) use have smart functionality, allowing the charging of an electric vehicle when there is less demand on the grid, or when more renewable electricity is available.
- 2.3.3 The regulations also ensure that EVCs meet certain device-level requirements, enabling a minimum level of access, security, and information for consumers. The regulations cover electric vehicle private EVCs sold for use in a domestic or workplace environment in Great Britain and smart cables (defined as an electrical cable which is a EVC and can send and receive information). The regulations state that EVCs sold for the intended private charging of vehicles must meet certain device-level requirements, which include smart functionality, including the ability to send and receive information, the ability to respond to signals to increase the rate or time at which electricity is supplied, and the ability to be remotely accessed and controlled.

Decarbonising Transport: A Better, Greener Britain (DfT, 2021a):

- 2.3.4 This document presents the path to net zero transport in the UK by 2050, the wider benefits it can deliver, and the principles that underpin the approach to delivering it. All non-zero emission HGVs are expected to be phased out by 2040, with lighter HGV's being phased out by 2035.

A Local Authority Guide to EV's (NG, 2022):

- 2.3.5 National Grid (NG) produced a guide for LAs on how to convert their fleets to zero-emission or battery electric vehicles. The guide covers topics such as developing an EV strategy and associated business case, cost comparison of EV to ICE, HGV charging, charging systems available to LCV's and cars, smart charging and vehicle prioritization, payment, and management solutions, and more. The guide also includes a glossary of terms and acronyms commonly used in the EV industry. The document is intended for LAs looking to transition their fleets to electric vehicles and provides a comprehensive overview of the steps involved in the process.

Clean Air Strategy (DEFRA, 2019):

- 2.3.6 The National Clean Air Strategy 2019 is a UK government plan to reduce emissions across all sources of air pollution, making the air healthier to breathe, protecting nature, and boosting the economy. This strategy builds on the UK Plan for Tackling Roadside Nitrogen Dioxide Concentrations, launched by the Government in 2017, which directed five cities and 23 LAs with the worst NO₂ concentrations to produce air quality plans to achieve compliance with the national air quality objectives in the shortest possible time. In 2018, the UK government directed a further 33 LAs which have short term NO₂ problems to submit studies identifying measures that will achieve compliance in the shortest possible time. The Clean Air Strategy 2019 sets out plans to reduce emissions across all sources of air pollution, including agriculture, industry, and transport. The strategy proposes tough new goals to cut public exposure to particulate matter pollution, as recommended by the World Health Organisation. The government aims to reduce emissions of five of the most damaging air pollutants (fine particulate matter, ammonia, nitrogen oxides, sulphur dioxide, non-methane volatile organic compounds) by 2020 and 2030. The strategy also contributes to the government's action on clean growth, as action to clean up the air will boost productivity and economic growth.

On-street Residential Chargepoint Scheme (OZEV, 2023):

- 2.3.7 The On-street Residential Chargepoint Scheme (ORCS) is a UK government scheme that provides funding for LAs (including in Wales) towards the cost of installing on-street residential electric car chargers. The scheme is run by the Energy Saving Trust (EST) for the Office for Zero Emission Vehicles (OZEV) and has an allocated pot of money available to LAs on a first-come, first-served basis. The purpose of the scheme is to increase the availability of on-street EVCs in residential streets where off-street parking is not available. By installing EVCs on-street or in public car parks, residents without off-street parking will have access to EVCs close to home.

2.4 Other Relevant Policies & Strategies

Charging Electric Vehicles - Energy Saving Trust (EST, 2023)

- 2.4.1 The Energy Saving Trust provides a guide on how to charge your electric vehicle (EV) to get the most driving range out of your battery, to reduce the cost of recharging. They suggest that EVCs can be installed in various locations such as homes with a garage or driveway, at workplaces, on residential streets, in town centres, public car parks, and at destinations such as shopping centres or motorway service stations.
- 2.4.2 The Energy Saving Trust also provides resources to help LA officers deliver public charging infrastructure, including webinars and best practice guidance. They have published a best practice guide on getting the best out of electric vehicle batteries, home, and public EVCs, and maximizing savings. According to the Energy Saving Trust, recharging an EV at home (overnight) will normally result in the greatest cost savings, as the cost of electricity is lower compared to petrol or diesel. A full charge in a pure electric vehicle will give a typical range of around 220 miles and will cost approximately £23 if charging at home. Driving 220 miles in a petrol or diesel car will cost around £41 in fuel, which can be nearly twice as high as the cost of charging the electric car. The cost savings will be most significant when owners charge at home and have access to an off-peak overnight electricity tariff. Smart charging is a safe and convenient way of charging your electric vehicle (EV) at times when demand for electricity is lower, for example at night, or when there is lots of renewable energy on the grid. Charging during these off-peak times not only reduces costs for EV drivers by using cheaper energy rates, but also helps to prevent unwanted intervals of high demand for electricity from the grid.

3. OPTIONS FOR DELIVERING & OPERATING EVC

3.1 Off-Street Charging Provision

3.1.1 Off-street charging refers to the charging of EVs anywhere that is not on or next to the streets, this could involve charging hubs (stations).

Requirements for off-street charging:	Challenges associated with off-street charging:
- EVCs 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. - EVCs must be incorporated into existing street furniture or parking bays. 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. - EVC design and placement should meet accessibility standards and guidance.	- Lack of off-street parking: Many people in the UK live in flats or terraced houses without access to off-street parking, which makes it difficult for them to charge their electric vehicles at home. - Cost of installation: Installing a home charging point can be expensive, and not everyone can afford it. The government has introduced the EVC Grant, which contributes up to 75% of the cost of a home charge point or wall-box to a cap of £350, but it is only available to EV owners living in rented accommodation or a flat who have dedicated off-street parking at their property. - Availability of charging points: Although the UK has more public places to charge electric vehicles than petrol stations, there are still not enough charging points in some areas, which can make it difficult for EV owners to find a charging point when they need it. - Energy prices: The recent market volatility in energy prices has resulted in significant increases in the unit price of electricity. As a result, many EVC operators have had to increase fees to customers to cover the increased cost of electricity. - Damage to pavements and footpaths: Installing charging points on pavements and footpaths can cause damage or injury, and some local authorities do not permit the installation of pavement channels or gullies to accommodate charging cables.

3.2 On-Street Charging Provision

3.2.1 On-street Charging: Charging electric vehicles on the street, anywhere on or along the pavement of the streets.

- Requirements for On-street charging to obtain funding support from On-street Residential Chargepoint Scheme (ORCS):
 - Applications must be made for one or more EVCs, up to 22kW.
 - Local authorities must be satisfied that the EVCs should be used primarily to meet the needs of local residents.
 - The proposed location or locations must lack off-street parking. For instance, this can be proved by providing photographs or maps.

- The EVCs should be accessible to local residents. The EVCs should be available for use on a 24/7 basis. Exceptions will be considered where these are justified. While considering the use of dedicated EV bays, these require a traffic regulation order (TRO) that can restrict access to EVs only.
- The EVCs must adhere to all relevant technical regulations, including the Public Charge Point Regulations, which, subject to parliamentary passage, will require contactless payment at new EVCs 8 kW and above, within one year of the regulations being laid.
- Considering accessibility in relation to the proposed infrastructure.
- Must follow procurement rules and consider value for money.
- Must provide details of operating arrangements.
- The project must be completed within reasonable timescales and no later than 1 March 2025.

Other requirements:	Challenges associated with On-street charging:
• Need of a driveway to get a wall-box: User must check with their current wall-box provider. In most cases, it might need off-street parking such as a driveway or garage due to unavailability of charging lead or non-stretchable charging lead. • Requirement of extension cable: In most instances, a standard three-pin socket is not enough to charge an electric car. Trying to use it for this purpose can pose serious risks – such as starting a fire. So, user might require extension cable in this instance. • Walking distance to charge points: The distance of charging points from the home, as well as around destinations, was a key consideration for participants; it was considered absolutely essential for charging points to be located within a 5-10 minute walk from these locations. • Access to 'live' information: Participants, particularly BEV drivers without access to off-street parking, were interested in having access to 'live' information on charging points that provides updates on whether they are functioning and unoccupied.	• Charging preferences of drivers without off-street parking: There is no clear preference for charging locations among current ICEV users without off-street parking, and the location where drivers without off-street parking will charge in the future will depend on several variables. • Finding the right mix: The required mix of rapid charge points and on-street units is not clear, with the Taking Charge report saying this is down to rapid developments in battery and charging technology, as well as consumer preferences about where and when people would like to charge are not known. • Lack of strategic planning: Charging points in rural areas are often based on individual investment decisions at destinations, rather than being part of a strategic plan. • Power outages: Rural areas are more likely to experience power outages due to storms, which can affect the reliability of charging points. • Conventional vehicles can block on-street charging points and cannot be available to EV's. • Lampposts will only support slow charging. • Narrow pavements could lead to additional street clutter / trip hazards • Parking conflicts – especially when bays are placed directly outside properties. • Where lampposts are located at the back of footway, an additional post / bollard will be required if taking charge from the lamppost.

3.2.2 Some solutions to challenges presented by on-street charging are presented below in Table 2Error! Reference source not found..

Table 2: On-Street Charging Provision Types

Description	Photo	Example Operators
Lamppost Charging: Chargers implemented into existing infrastructure, keeps footways clear of additional street clutter	 Source Imagery: Ubitricity, 2023.	• Electric Brighton • Ubitricity
Bollard Charging: Dedicated bollards, some of which can retract underground within the footway when not in use	 Source Imagery: Urban Fox, 2024	• Urban Fox • Char.gy
Cable Gully: Through-pavement channel, seamless in order to eliminate trip hazards, quick installation time	 Source Imagery: KC, 2023.	• Kerbo-Charge • Gul-e

3.3 Hub Charging

3.3.1 **Residential hub charging:** These hubs could be located on council-owned land excluding residential homes, schools, care site offering residential services, leased properties, agricultural land, greenfield sites, secure sites, and sites where public access might impede services. Hubs are located close to residential area without having access to off-street parking (less than 500m walk) and should consider the following:

- **Location:** Suitable location for the charging infrastructure is a key thing to consider. Location should be publicly accessible (24/7), well-placed, and strategically positioned to cater the needs of EV users.
- **Grid infrastructure:** Assessing the electrical grid infrastructure requirements is crucial to accommodate EV charging. Understanding the potential costs for connecting the charging hubs to the grid.
- **Stakeholder relation:** Handling complex stakeholder relations and ensuring that the charging hubs are inclusive, accessible, and beneficial for local communities is vital.
- **Charging Network:** Evaluating the need for a network of charging points, including ultra-rapid hubs to meet long-distance en-route charging needs.
- **Technical framework and design:** Developing a technical framework design for public charging hubs, including DC charging combined with local energy storage.

3.3.2 Vacant brownfield sites can be reinstated back into sustainable use. EV charging hubs are facilities that promotes environmental sustainability through supporting a transition to EV, which in turn reduces CO2 emissions.

3.4 Types of EVCs

Low Speed and Standard EVCs:

3.4.1 Low speed and standard EVCs are often the cheapest to use and are suitable when vehicles are parked for several hours, such as during working hours or overnight. These include on-street public chargers in residential areas of villages, town, and cities and off-street private charging points in households with off-street parking availability. Low speed chargers have a power output between 0 and 8kw.

Fast EVCs:

3.4.2 These EVCs are ideal when vehicles are parked for a few hours. This can include hotels, shopping centres, leisure centres, tourist destinations or car parks used for more than 2 hours. Power outputs can vary between 8kw and 49kw.

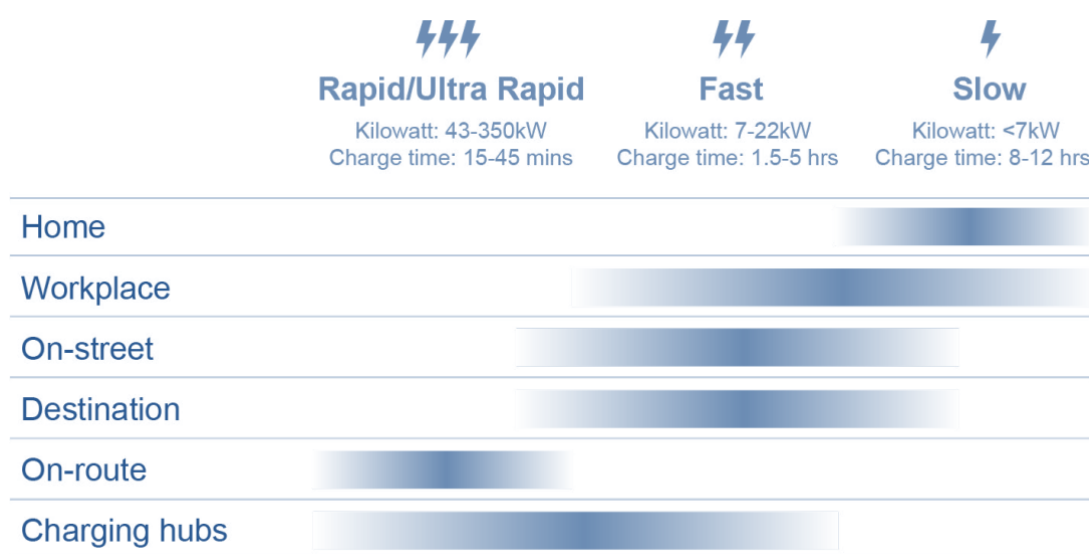
Rapid EVCs:

3.4.3 These are suitable for EVs parked for a quick break, such as at service stations, taxis, or commercial vehicles. They have a power output between 43kW and 50kW, taking 25-40 minutes for an 80% recharge, depending on the vehicle.

Ultra-Rapid EVCs:

- 3.4.4 With a power output of over 50kW, these EVCs can provide around 200 miles of range in half an hour. They are useful for EVs that need to refuel without a break, like refuelling at a petrol station. However, at present, few EV models can accept an ultra-rapid charge.
- 3.4.5 It is worth noting that ultra-rapid EVCs are becoming more common, with chargers typically rated at 100kW upwards, and 350kW chargers starting to appear in the UK. These ultra-rapid chargers can refill an EV battery to 80% in around 20 minutes.

Figure 1: Charging Types & Speeds



Source: WG, 2021a

3.5 Plug Technology

- 3.5.1 A wide variety of electric vehicle plug technologies are currently in use. This variation in design has been driven by a wide range of factors. Two power supply options exist for charging vehicles, and these are:
- Alternating current (AC): Using single phase 220V supplies or three-phase 400V supplies and the following connector types: UK 3-pin (BS 1363), Industrial Commando (IEC 60309), American Type 1 (SAE J1772), and European type 2 (Mennekes, IEC 62196).
 - Direct current (DC): faster chargers typically use DC power and the use the following connector types: Japanese JEVS (CHAdeMO), European Combined Charging System (CCA or Combo), Tesla's supercharger connector.
- 3.5.2 The range of AC connectors are shown in **Error! Reference source not found.** below. Except for the rapid chargers used for taxis. This type of connector is rapidly becoming a universal standard across in the UK, and it is highly likely that most EV drivers will carry a Type 2 cable and connector in their vehicle.

Figure 2: Fast Connectors



Source: Zap-Map

- 3.5.3 Rapid charger is fitted with the following tethered connectors: Japanese JEVS (CHAdeMO), European Combined Charging System (CCA or Combo), and European type 2 (Mennekes, IEC 62196). The configuration of these 3 connectors is shown in the image below, along with the Tesla Type 2 rapid connector:

Figure 3: Rapid Connectors



Source: Zap-Map

3.6 Charging Costs

- 3.6.1 The prices of EV charging on the public network can vary substantially, and prices are increasing due to current issues in the energy market. According to Zap-Map Price Index, the difference in prices paid depends on the type of the charger and will also track how this changing over time.
- 3.6.2 The average cost of charging an EV on the public charging network in the UK varies based on the chain, location, and speed of the chargers. The average cost for a full charge is around £26 (PP, 2023).
- 3.6.3 However, the weighted average price to charge an EV on the Public network in December 2023 was 55p/kWh on slow/fast chargers and 81p/kWh for rapid chargers (ZapMap, 2023).
- 3.6.4 The price of public rapid charging has risen by 50% since May 2022, making the cost of electric car more expensive than using petrol or diesel. According to Zap-Map, the average price per kilowatt-hour (kWh) of rapid charger is now £0.75.
- 3.6.5 It is important to note that the cost of charging an electric car can vary depending on the time of day, the location, and the type of charger used. For example, charging at home is the most cost-effective way to keep your car fully charged, costing about £17 for a full charge. Charging at work is also an option, with many employers offering free access throughout the day.

3.7 Range Anxiety

3.7.1 Range anxiety is the fear of driving an electric car and running out of power without being able to find a charging point on time to replenish. This fear is often unwarranted due to several reasons:

- **EV Range:** The average EV today has a range of 217 miles (349km), which exceeds the average daily commute distance in Wales.
- **Charging Infrastructure:** Charging stations are widely available, and fast charging infrastructure is more accessible than many people think.
- **Charging Anxiety:** While worries about EV range might be fading, they are being overtaken by a different concern: charging anxiety, which revolves around drivers' fears of charging availability, time, cost, and payment methods.

3.7.2 This fear can be a psychological barrier to the widespread adoption of EVs, as it may prevent potential buyers from feeling confident about the reliability of EVs for their daily travel needs. As charging technology improves and more EVCs are installed, using EVs becomes more practical, and the issue of range anxiety is being addressed.

3.8 Sustainable Power Sources

Solar Energy

3.8.1 One of the best options to reduce the cost of charging an EV is to charge at home. Solar panels work by converting sunlight into electricity, which can then be used to charge the EV battery. The average domestic solar PV system can generate one to four kilowatts of power, enough to fully charge an EV with a 40 kWh battery capacity in just over eight hours. Using Solar Power can be cheaper than using grid power.

3.8.2 Installing solar batteries for home energy storage can allow excess energy generated by solar panels during the day to be stored and used for charging electric vehicles at night, ensuring that the EV is charged with clean energy from the sun.

3.8.3 It is acknowledged that most homeowners may not be able to fully charge their EVs solely using solar energy, however it can still contribute to a greener approach to using an EV and reduce reliance on non-renewable energy sources.

Hydropower

3.8.4 The UK's wet climate provides a plentiful supply of fast-running water, making it particularly well-suited for generating electricity using hydro technology.

3.8.5 Hydropower-based EV charging stations work by harnessing the energy from flowing water to generate electricity for charging electric vehicles.

3.8.6 There are ongoing projects, such as the lif-E-Buoy project, which aim to use hydrokinetic energy of running water to generate clean energy for electric vehicles and infrastructure, indicating the serious potential to use hydro generators for the charging of electric vehicles and providing power for infrastructures located near or on rivers.

Wind Energy

- 3.8.7 Wind power is completely clean and emits no greenhouse gases or air pollutants. Wind is an abundant resource that can be harnessed almost everywhere around the world.
- 3.8.8 Wind powered charging stations can operate off-grid, providing remote locations access to EV charging without relying on traditional power grids. This offers immense benefits, particularly in rural areas.
- 3.8.9 Integrating wind-powered EV charging with smart grid technology enables a two-way flow of electricity. Excess power generated by wind turbines can be fed back into the grid, reducing strain during peak demand periods.
- 3.8.10 This flow optimises the utilisation of renewable energy, minimises waste, and enhances the overall efficiency of the charging process.

4. EXISTING SITUATION

4.1 EV Registrations in Conwy

- 4.1.1 The number of plug-in EVs has been increasing by a more rapid rate since 2019 in both Wales and Conwy, as shown below in Figure 4Error! Reference source not found. and Figure 5Error! Reference source not found..

Figure 4: EVs Registered in Wales 2012-2023 Q3

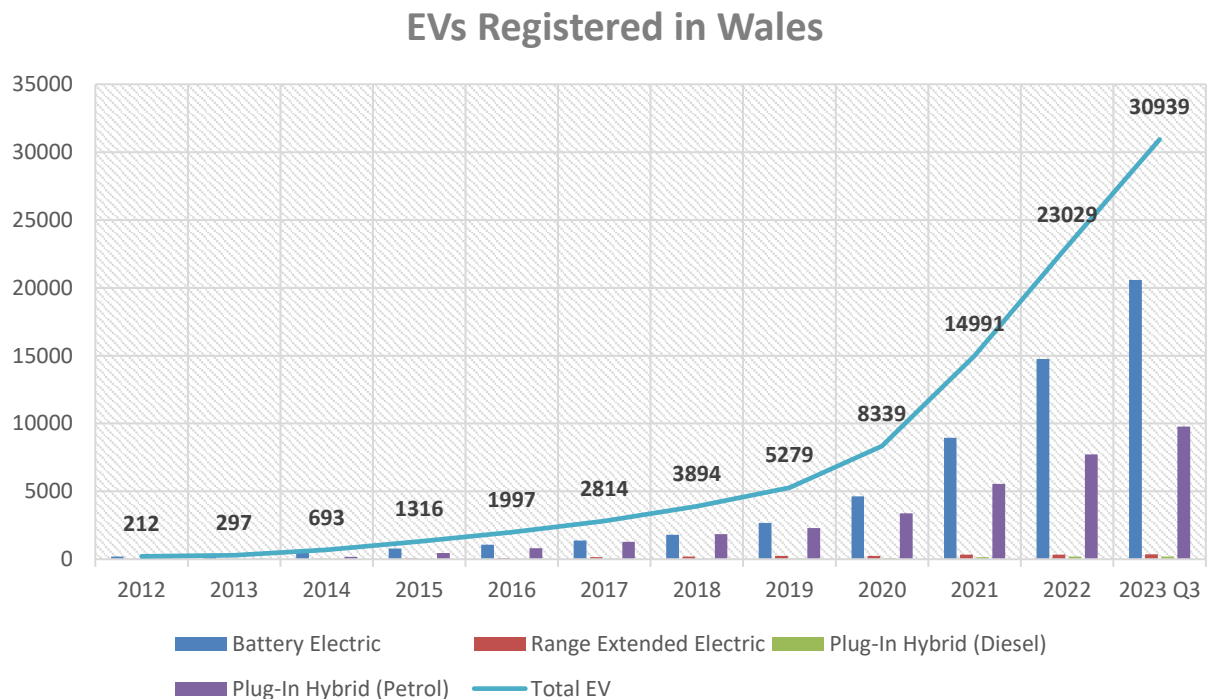
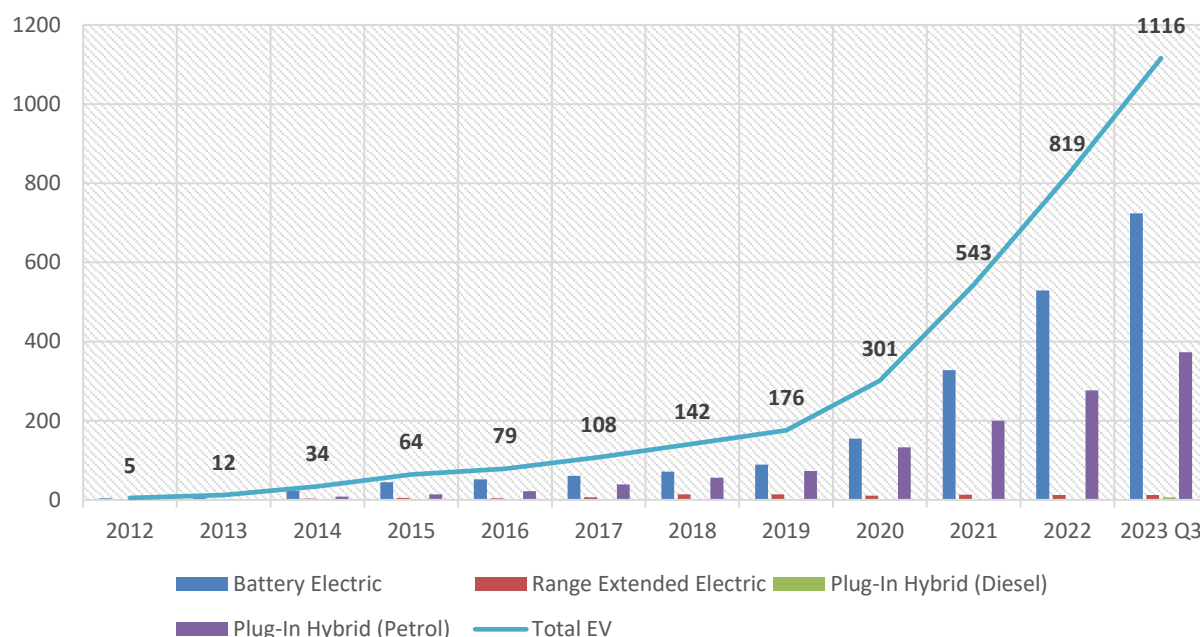


Figure 5: EVs Registered in Conwy 2012-2023 Q3

EVs Registered in Conwy



- 4.1.2 The above graphs have been summarised in Table 3 below which shows the total number of registered EVs from 2020 to 2023 Q3 in both Conwy and across Wales, including the percentage increase in EVs from the previous year. EV data for Wales and Conwy can be found in full within Appendix 1.

Table 3: EVs Registered in Conwy & Wales

		2020	2021	2022	2023 Q3
Wales	Total EVs	8,339	14,991	23,029	30,939
	All Vehicles	1,962,294	1,992,170	2,018,690	2,055,775
	% EVs	0.4%	0.8%	1.1%	1.5%
	Annual EV Growth	+37%	+44%	+35%	+26%*
Conwy	Total EVs	301	543	819	1,116
	All Vehicles	77,170	77,821	78,274	79,353
	% EVs	0.4%	0.7%	1.0%	1.4%
	Annual EV Growth	+42%	+45%	+34%	+27%*

*To end of September 2023, part year

- 4.1.3 At the end of 2022, a total of 23,029 vehicles in Wales and 819 vehicles in Conwy were plug-in vehicles. These figures had risen to 30,939 and 1,116 respectively by the end of Q3 2023. Although the full year figures had not been released at the time of writing, this suggests that the growth of plug-in vehicles is on a similar trajectory to recent years.
- 4.1.4 A total of 2,055,775 vehicles were registered in Wales and 79,353 vehicles were registered in Conwy at the end of 2023 Q3, therefore EVs represented 1.5% and 1.4% of all registered vehicles respectively.

4.2 EV Chargers in Conwy

- 4.2.1 Based on information gathered and extracted from the online Zap-Map (Zap-Map, 2024), there are currently circa 29 locations across Conwy accessible by the general public, with an additional 8 locations available for the use of customers/guests. Given the nature of EVs and EVCs, data presented on Zap-Map is constantly evolving, and comes with limitations, including the determination of whether a EVC is available for use by the general public, use by customers/guests or completely private.
- 4.2.2 Out of the charging locations that are classed as publicly accessible or publicly accessible for customers/guests a total of 115 chargers are provided, a breakdown of the speed of these chargers is provided in Table 4 below, and displayed in full within Appendix 2.

Table 4: Existing EVCs

Slow (3kW-11kW)	Fast (7kW-22kW)	Rapid (+43kW)
14	82	19

- 4.2.3 Given the relatively limited availability of existing public chargers it has also been assumed that the existing owners of EVs in Conwy are likely to utilise at home chargers, and therefore there is circa 819 at home chargers in Conwy.

4.3 Publicly Available Off-Street Car Parks

4.3.1 CCBC own 38 car parks across the county, including 24 Pay and Display (P&D) car parks with circa 2,450 car park spaces and 14 free car parks. It should be noted that some of the free car parks will have restrictions, such as maximum length of stay, whereas others may not. Some free car parks are sponsored by local town councils and are therefore subsidised, whereas others are free to use. Free car parks have not been broken down further, however P&D car parks have been reviewed in terms of length of stay:

- There are circa 246 car parking spaces priced towards encouraging short-stay parking across Conwy's P&D car parks such as Market Place Conwy, Town Hall Llandudno, Vicarage Gardens Conwy;
- There are circa 942 car parking spaces priced towards encouraging long-stay parking across Conwy's P&D car parks, such as Happy Valley Llandudno, Morfa Beach, Colwyn Bay Promenade; and
- There are circa 1,272 car parking spaces in Conwy's P&D car parks where tariffs are inclusive of any durations of stay.

4.3.2 An income analysis for the 21 P&D car parks for which income data was available has been conducted based on the number of spaces available and income received in 2022/23, the data can be found in full within Appendix 3, with a selection of the top car parks based on proportional income summarised as follows:

- The largest proportion of parking spaces, 13.9% (circa 340 spaces) are located at The Parade, Llandudno, which also accounts for the largest proportion of income (circa 22%). Whilst classified as a P&D car park, it should be noted that the parking provision is kerbside along the promenade;
- The top earning car park per available space is Vicarage Gardens in Conwy, which represents 4% (circa 99 spaces) of the total car parking capacity of CCBC, and 19% of total income.
- The other top car parks in terms of income per parking space include Happy Valley, Llandudno, Town Hall Llandudno, Market Place Conwy and Pont Y Pair in Betws y Coed.
- It should be noted that a number of P&D car parks did not have data available and therefore have not been included in this analysis, in addition to this a selection of the car parks only had data available from a selection of parking machines, such as due to out of order machines etc.

4.3.3 It is understood that at the time of writing, EVCs within CCBC owned car parks is very limited, with only two EVCs (at Colwyn Bay Promenade) available across the 38 LA owned car parks.

4.4 Household Composition

- 4.4.1 There were approximately 52,238 households in Conwy at the time of the 2021 Census, of which 42,547 (81.4%) had access to at least one vehicle.
- 4.4.2 For the purposes of this strategy, the residents that are more reliant on potential on-street charging facilities has been assumed to be those living in terraced housing, and those living in flats/apartments, a data map indicating the areas with a higher proportion of car ownership by property type can be found in Appendix 4.
- 4.4.3 The majority of households (68%) were not terraced houses or flats/apartments, and so are assumed to have access to off-street parking such as driveways and garages and therefore have potential access to off-street electric vehicle charging facilities.
- 4.4.4 There were approximately 7,380 terraced houses across Conwy at the time of the 2021 Census, which represents approximately 14% of the housing stock in the county. An estimated 6,182 of these households have access to at least one car, representing approximately 84% of terraced households. The areas of Conwy with the highest numbers/proportions of terraced housing include:
- Western areas of Penmaenmawr (364 terraced houses, 58% of housing);
 - Colwyn Bay, on streets served via Rhiw Road (351 terraced houses, 54% of housing);
 - Old Colwyn, on streets served via Swn-Y-Don (280 terraced houses, 53% of housing);
 - Llandudno, on streets served via Bryniau Road (277 terraced houses, 37% of housing); and
 - Abergele, on streets to the east of Dundonald Avenue (245 terraced houses, 28% of housing).
- 4.4.5 Some terraced houses do have access to off-street parking, however the majority rely on kerbside parking on-street.
- 4.4.6 There were approximately 9,378 flats/apartments in Conwy at the time of the 2021 Census, which represents approximately 18% of the housing stock in the county. An estimated 55% of flats/apartments have access to at least one car, representing 5,181 households. The areas of Conwy with the highest numbers/proportions of flats/apartments include:
- Western areas of Colwyn Bay, on streets served via Western Promenade and Prince's Drive (736 flats/apartments, 73% of housing);
 - Northern areas of Llandudno, on streets to the north of Gloddaeth Street/Avenue (652 flats/apartments, 65% of housing);
 - Eastern areas of Colwyn Bay, on streets served via Abergele Road (542 flats/apartments, 66% of housing);
 - Central areas of Llandudno, on streets served via Trinity Avenue and Mostyn Street (538 flats/apartments, 58% of housing); and
 - Central areas of Llandudno, on streets served via Conway Road and Mostyn Broadway (437 flats/apartments, 56% of housing).

- 4.4.7 The highest concentrations of flats/apartments are located around the key town centres such as Llandudno and Colwyn Bay. As per the terraced housing, some flats have access to off-street parking courts/areas whereas others are more reliant on on-street kerbside provision.
- 4.4.8 It is noted that car ownership levels vary across the LA area, with the highest proportions of households with no cars/vans in the household in more urban areas such as Llandudno, Colwyn Bay and Pensarn, and lower proportions in more rural areas such as Betws-yn-Rhos, Llangernyw and Llansannan.

4.5 Travel Demand – Local

- 4.5.1 The *‘Electric Vehicle Strategy for Wales’* (WG, 2019) notes that EV users will predominately charge at home for reasons of cost and convenience, and this would support the large majority of local trips. However, it is acknowledged that most users would occasionally require charging away from home, particularly on long journeys.
- 4.5.2 Local trips include those such as shopping and leisure trips, where the origin and destination are likely to be in close proximity of one another. This may include short trips within the same town/urban area, or longer trips between more rural areas and towns with more amenities.

4.6 Travel Demand – Commuting

- 4.6.1 *‘Distance travelled to work’* data from the 2021 National Census (ONS, 2023c) indicates that 36.2% of people in employment in Conwy travel less than 10km to work, with 17.4% travelling between 10km and 30km, and 7.6% travelling over 30km and over to work. The remainder of people in employment worked from home or at no fixed address at the time of the Census. This suggests that the majority of Conwy residents in employment travel relatively short distances to a place of work, and therefore only a small proportion are likely to rely on workplace or destination charging as a method of charging an EV.
- 4.6.2 The average journey length of people who work in Conwy and travel from other LA areas has been established utilising Origin-Destination data contained within the 2021 National Census (ONS, 2023f), with the data provided in full within Appendix 5. A total of 6,096 travel into Conwy for work from other LA areas, 48% of which travel to/from Denbighshire, followed by 21% to/from Gwynedd, and 11% to/from Flintshire. The ten LAs that have the highest numbers of people working in Conwy has been presented below in Table 5 **Error! Reference source not found.**, alongside the roughly estimated journey distance.

Table 5: Workplace Journey Length

Residence	Approx. Distance Travelled	Proportion*
Denbighshire	1-70km	48.4%
Gwynedd	4-100km	21.0%
Flintshire	70km	10.8%
Isle of Anglesey	30-60km	9.2%
Wrexham	85km	1.9%
Cheshire West and Chester	70km	1.9%
Wirral	90km	0.6%
Manchester	130km	0.4%
Cheshire East	80km	0.3%
Liverpool	120km	0.3%

- 4.6.3 It is expected that a proportion of the people who travel into Conwy for work may generate demand for workplace charging, especially those travelling considerable distances with a round trip distance that is outside the range of a typical EV when range anxiety (see Section **Error! Reference source not found.**) is taken into account.
- 4.6.4 The provision of EVCs in appropriate locations to serve those travelling to work in Conwy is therefore a key consideration of this strategy.

4.7 Travel Demand – Tourism

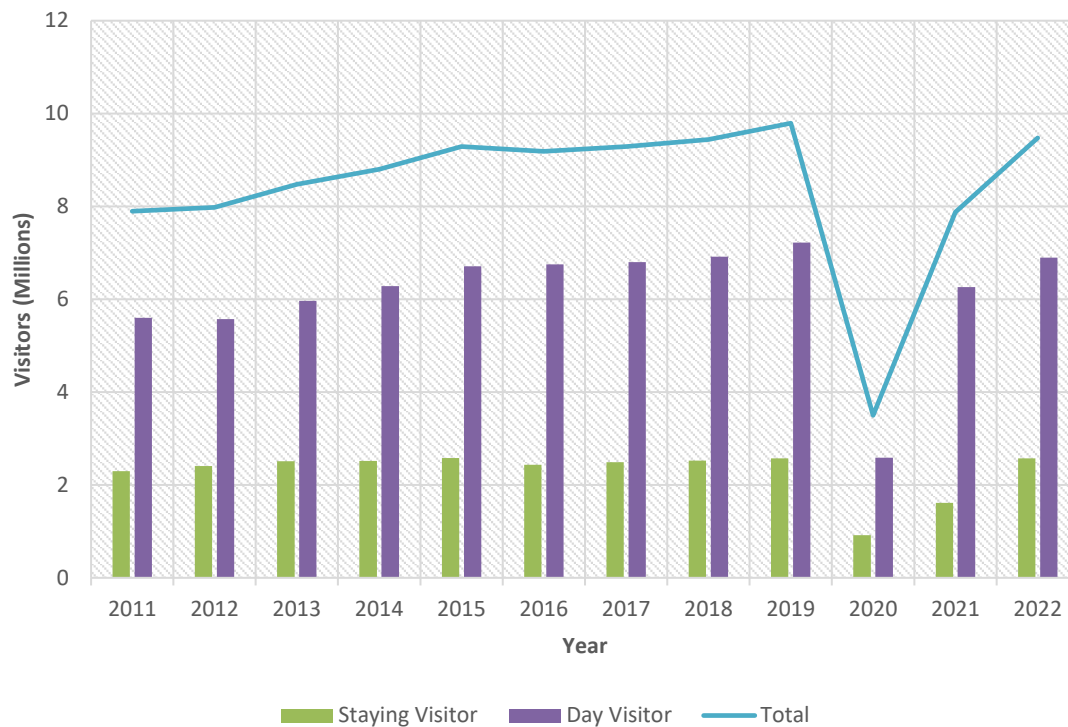
Introduction to Tourism in Conwy

- 4.7.1 Scarborough Tourism Economic Activity Monitor (STEAM) found that the total economic impact of tourism in Conwy in 2022 was £1.10 billion, generated from 9.5 million visitors (STEAM, 2022).
- 4.7.2 Conwy is not just ideally situated for discovering North Wales, but it is also well placed as a base from which to explore South Wales, North-West England, as well as Ireland (via a Ferry). Conwy's location means that it has a visitor catchment that, within 3 hours driving time, encompasses a large number of the major Northern England conurbations such as the cities of Liverpool, Manchester, Birmingham and Leeds, representing a huge part of the UK population.
- 4.7.3 The '*Destination Conwy Management Plan 2023-2029*' has a vision to make Conwy successful on a national and international stage, including increasing the use of greener travel and transport infrastructure (CCBC, 2023).

Annual Visitor Numbers

- 4.7.4 The number of annual visitor numbers to Conwy from 2011-2019 was steadily increasing, with nearly 9.8 million visitors in 2019. Due to the Covid-19 pandemic the visitor numbers drastically dropped off in 2020, and has rapidly increased since, with tourism numbers reaching pre-covid levels. In 2022 there was a total of 9.5 million visitors, made up of 6.9 million day visitors and 2.6 million staying visitors, the data can be found in full within Appendix 6.

Figure 6: Tourism Numbers in Conwy



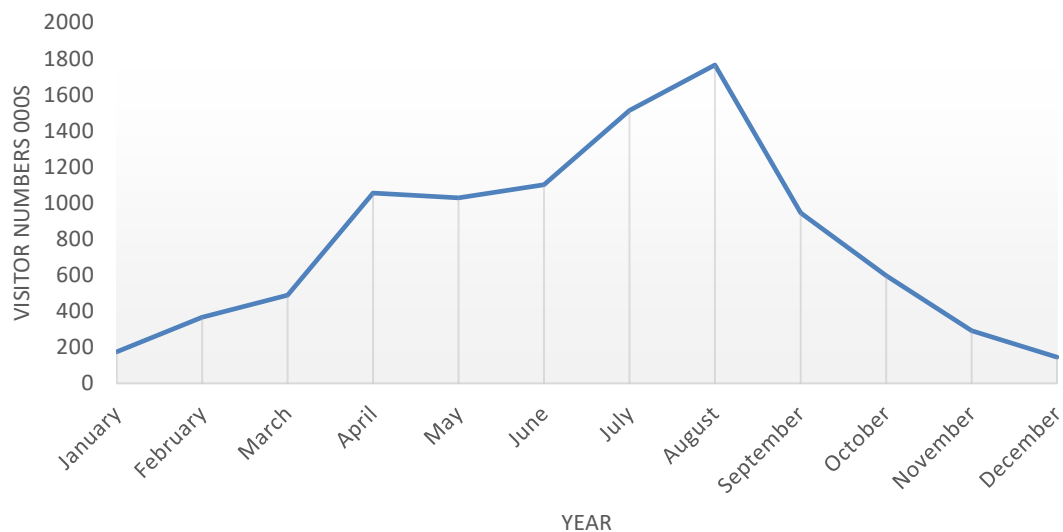
Data Source: STEAM, 2022.

- 4.7.5 Given the high level of tourism across the county of Conwy, it is expected that there will be demand for EV charging generated by tourists visiting the area. **Error! Reference source not found.** above shows tourist numbers separated by staying visitors and day visitors. It is expected that day visitors would favour fast EVCs to allow them to 'top up' along their route, with slow EVCs for staying visitors needing to charge their vehicles overnight.
- 4.7.6 On average, it has been assumed that day visitors to Conwy, have three people per vehicle, with the average allowing for solo/couple visitors, as well as those who visit the county via coach etc. Based on this assumption, and not taking into account seasonal difference there would be circa 2,359 daily vehicle trips generated by tourism across Conwy, which is equivalent to circa 570,000 vehicles per annum.

Seasonal Demand

- 4.7.7 The seasonal demand for EVCs in the UK can significantly affect the country's infrastructure. During peak periods, such as holiday getaway weekends and the summer season, the existing charging infrastructure may face challenges in meeting the increased demand, leading to queues at charging sites and potential frustrations among EV owners. The seasonal profile of tourism in Conwy is shown below in Figure 7**Error! Reference source not found..**

Figure 7: Seasonal Profile



Data Source: STEAM, 2022.

- 4.7.8 This highlights the need for continued investment and expansion of the charging infrastructure to support the growing number of electric vehicles on the road, especially during peak periods. The increased demand for EV charging can also put pressure on the local distribution network, leading to the need for upgrades to the grid to support EV charging, particularly in areas with historical and active industrial or agricultural sectors and limited capacity for a surge in demand.
- 4.7.9 Estimates by National Grid indicate that EV charging could add between 3GW to 8GW to peak demand by 2030, increasing to 13 - 20GW by 2040, which could require reinforcement of the substation infrastructure (Deloitte, 2020).
- 4.7.10 Meeting the seasonal demand for EVCs will require a strategic approach to infrastructure development, investment, and grid upgrades to ensure that the changing needs of the growing EV fleet are adequately met, especially during peak periods.

4.8 Existing Taxis & PHVs in Conwy

- 4.8.1 Information provided in the dataset 'TAXI0105: Taxis and Private Hire Vehicles (PHVs) per 1000 people by licensing area and rural-urban classification: England and Wales' contains data regarding the total number of taxis and PHV in Conwy. A total of 97 taxis and 136 PHVs were registered in April 2023, therefore a total of 233 vehicles.
- 4.8.2 It is understood that 11 vehicles were EVs at the time of writing, representing 4.7% of the existing fleet. The existing EV fleet is operated by two private hire companies, both of which have charging facilities at the respective depots.
- 4.8.3 There are a total of 23 taxi ranks across the CCBC area, some of which are full time ranks and some of which operate during certain hours only.

5. FORECAST FUTURE REQUIREMENTS (2024-2030)

5.1 EV Growth Scenarios

5.1.1 Section 4.1 of this report provides details of the existing numbers of electric vehicles registered Conwy, with Section 4.2 outlining the number of existing EVCs.

5.1.2 At the end of 2022, a total of 819 vehicles in Conwy were plug-in vehicles, with 1,116 vehicles by the end of Q3 2023. Based on the trajectory of growth between 2022 and Q3 2023, 1,190 plug-in vehicles were expected to be registered in Conwy by the end of 2023.

Forecast Growth

5.1.3 The growth in both the number of plug-in vehicles and all vehicles in Conwy between 2021 and 2023 has been analysed using data from the DfT (DfT, 2023c), and this data has been utilised to project both the forecast total number of vehicles and EVs each year up to 2030, as shown in Table 6, **Error! Reference source not found.** with the full projections included within Appendix 1.

Table 6: Existing Projected EVs and Total Vehicles in Conwy

	Existing		Projected							
	2022	2023 Q3	2023	2024	2025	2026	2027	2028	2029	2030
Battery Electric	529	724	773	1116	1612	2329	3364	4858	7017	10136
Range Extended Electric	12	12	12	11	10	10	9	8	8	7
Plug-In Hybrid (Diesel)	1	7	9	9	9	9	9	9	9	9
Plug-In Hybrid (Petrol)	277	373	397	538	729	987	1337	1811	2454	3324
Total EVs	819	1116	1190	1666	2331	3261	4564	6386	8936	12504
All Vehicles	78274	79353	79623	80448	81282	82124	82975	83835	84704	85582
% EVs	1.0%	1.4%	1.5%	2.1%	2.9%	4.0%	5.5%	7.6%	10.5%	14.6%

5.1.4 Table 6 **Error! Reference source not found.** demonstrates that based on the current trajectory of growth, the number of EVs is forecast to increase by approximately 40% each year up to 2030, with EVs eventually making up approximately 14.6% of all vehicles in Conwy by 2030. The total number of vehicles is also projected to grow by approximately 1% per year, with the proportion of EVs rising year on year.

5.1.5 Based on an annual EV growth of approximately 40%, almost 75% of vehicles could be expected to be EVs by 2035, with significant growth occurring between 2030 and 2035.

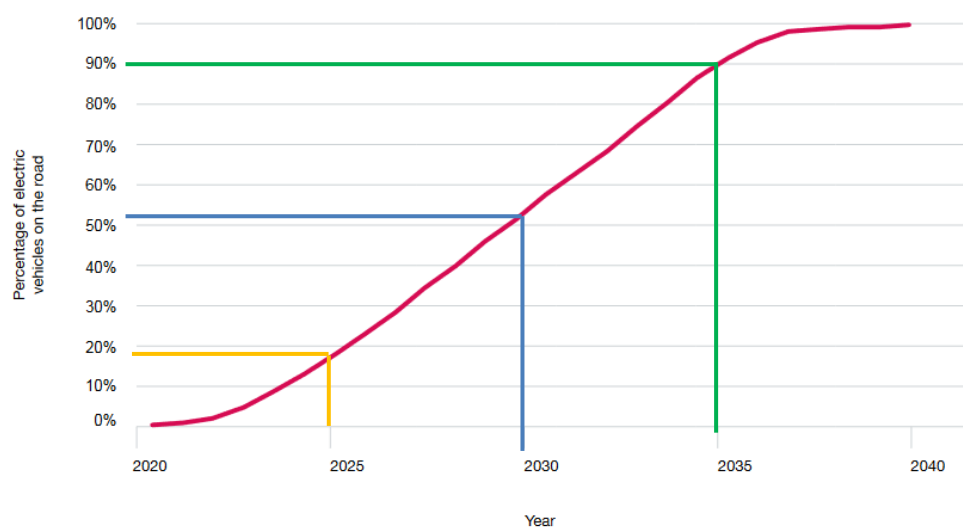
5.1.6 This is considered to represent the most likely growth scenario, as it assumes that the use of EVs would grow in line with the average annual growth between 2021 and 2023. Given that the number and proportion of EVs is currently low, this means that growth would be relatively low in the short-term, but would accelerate after 2030, which is reflective of the availability of existing charging infrastructure but can be influenced by the future availability of additional EVCs.

Stretch Growth

- 5.1.7 The Electric Vehicle Strategy for Wales (WG, 2019) considers the future charging needs for Wales based on a 'Leading the Way' scenario, which is based on forecasts produced by National Grid under their Future Energy scenarios. This scenario assumes that the transition to EVs happens effectively and is supported by adequate charging infrastructure, with the EV Strategy for Wales adjusting this scenario to account for a 2030 ban on the sale of petrol and diesel vehicles.
- 5.1.8 The 2030 ban has now been pushed back to 2035 by the UK government, and so the 'Leading the Way' scenario should be viewed in this context, but the EV Strategy for Wales includes the following graph showing the trajectory of EV take up:

Figure 8: 'Leading the Way' EV Uptake

Electric vehicle uptake curve based on 'Leading the Way' Future Energy Scenario 2020 and adapted for the 2030 ban



Source: WG, 2019

- 5.1.9 Figure 8Error! Reference source not found. demonstrates EVs would be expected to make up just under 20% of vehicles on the road by 2025, just over 50% by 2030 and approximately 90% by 2035 based on the 'Leading the Way' scenario. This is considered to represent a 'stretch growth' scenario, particularly given that the ban on the sale of petrol and diesel vehicles has been pushed back to 2035. It is also noted that only 1.5% of vehicles in Conwy were EVs at the end of 2023 and so take-up is currently well below the projected level in this scenario.
- 5.1.10 A potential take-up of 50% would equate to approximately 43,000 EVs in Conwy by 2030, but this is now more realistically likely to occur by 2035.
- 5.1.11 The vision of the Conwy LAEP (CCBC, 2022) to provide up to 2,150 EVCs by 2030 is also based on the 'Leading the Way' scenario of the EV Strategy for Wales (WG, 2019a), and so a lower number of EVCs is now likely to be more appropriate given current trajectories.

- 5.1.12 The potential range of EV take up by 2030 is therefore likely to be in the range of 15% under the forecast growth scenario, to 50% under the stretch growth scenario. Several factors are expected to impact the speed of take up, including the availability of public charging infrastructure, and any future change to the ban on the sale of petrol and diesel vehicles. Whilst this is a broad range, it does provide an indication of the likely EV charging provision requirements by 2030.

5.2 EVC Requirements

Off-Street Provision

- 5.2.1 As discussed in Section 2.1, the ‘Electric Vehicle Charging Strategy for Wales’ and associated documents contain targets for the provision of EVC infrastructure which are pertinent to Conwy. The guidance advocates “The provision of one public charge point for every 7 to 11 electric vehicles on the road by 2025. As adoption increases these numbers rise proportionately to approximately 25 vehicles per charge point.”
- 5.2.2 It is unclear from the guidance at what point of adoption that numbers would rise from one charge point per 7-11 vehicles to one per 25 vehicles, therefore it is important to consider a timeframe over which provision would proportionately change. Based on the proposed 2035 ban on petrol and diesel vehicles, it is reasonable to assume that one charge point per 7 vehicles would be required in 2024 to ‘pump-prime’ the provision, with one per 25 vehicles ultimately required by 2035, and provision incrementally changing over that period.
- 5.2.3 The potential public EVC requirement in Conwy under a low growth scenario between 2024 and 2030 is summarised in Table 7:

Table 7: Potential Off-Street EVC Requirement

	2024	2025	2026	2027	2028	2029	2030
Cumulative Projected EVs (Forecast Growth)	1666	2331	3261	4564	6386	8936	12504
Public EVC requirement	1 per 7 EVs	1 per 9 EVs	1 per 10 EVs	1 per 12 EVs	1 per 14 EVs	1 per 15 EVs	1 per 17 EVs
Cumulative EVCs in Conwy	238	259	326	380	456	596	736
Cumulative EVCs from existing (115)	+123	+144	+211	+265	+341	+481	+621

- 5.2.4 It is noted that public EVCs include all those accessible to the public, including in public car parks, private car parks (such as supermarkets) and on-street locations.
- 5.2.5 As detailed in Section 4.2, there are currently a total of 115 publicly accessible EVCs in Conwy, therefore an additional 123 public EVCs are expected to be required in the short-term in order to meet the requirements of the WG guidance, with provision then incrementally increasing over the coming years up to a cumulative EVC requirement of 736 EVCs by 2030.
- 5.2.6 The short-term EVC requirement would likely be much higher under a stretch growth scenario given the much higher projected trajectory of growth, although the ultimate requirement would most likely balance out once petrol and diesel vehicles begin to be phased out in 2035.

On-Street Provision

- 5.2.7 In terms of on-street charging provision, the Electric Vehicle Charging Strategy for Wales and associated documents note that *“On-street charging and in car parks will be encouraged in villages, towns and cities throughout Wales; with a view to installing on average one charge point for one in every three electric vehicles that cannot charge at home”*.
- 5.2.8 As discussed in Section 4.4, there were approximately 9,378 flats/apartments in Conwy at the time of the 2021 Census, of which 5,181 (55%) have access to at least one car. There were also approximately 7,380 terraced houses of which 6,182 (84%) have access to at least one car. Based on the one charge point per three EV guidance, Table 8 provides a summary of the likely EVC requirements for users that are unlikely to be able to charge at home:

Table 8: Potential On-Street EVC Requirement

	2024	2025	2026	2027	2028	2029	2030
Number of flats/apartments with a car	5,181						
% EVs	2.1%	2.9%	4.0%	5.5%	7.6%	10.5%	14.6%
Number of flats/apartments with EV	109	150	207	285	394	544	756
EVC Guidance	1 per 3 EVs that cannot charge at home						
EVC Requirement	36	50	69	95	131	181	252

Number of terraced houses with a car	6,182						
% EVs	2.1%	2.9%	4.0%	5.5%	7.6%	10.5%	14.6%
Number of terraced houses with EV	130	180	247	340	470	649	903
EVC Guidance	1 per 3 EVs that cannot charge at home						
EVC Requirement	43	60	82	113	157	216	301

Total EVC Requirement	79	110	151	208	288	397	553
------------------------------	-----------	------------	------------	------------	------------	------------	------------

- 5.2.9 Table 8 demonstrates that 553 EVCs could be required by 2030 to service households that are unlikely to be able to charge at home, with this number expected to increase after 2030 as EV take up increases.
- 5.2.10 As discussed in Section 4.4, it is recognised that some flats, apartments and terraced houses do have off-street parking, but that the majority are likely to rely on kerbside parking. The requirement for 553 EVCs by 2030 may therefore be reduced slightly, but provides a useful indication of the overall target provision.
- 5.2.11 This charging provision could either be kerbside on-street chargers (as discussed in Section **Error! Reference source not found.**) or off-street provision in public car parks. For example, flats/terraced houses located within close proximity (e.g. a 5-minute walk) of a public car park could utilise this off-street provision to charge vehicles overnight, when demand from visitors is lower.

- 5.2.12 The type of on-street charger provided would determine whether the charger is publicly accessible or not, with the different charger types discussed in detail in Section **Error! Reference source not found.** Any on-street chargers that are publicly accessible, such as bollard or lamppost chargers, could be considered to be part of the wider publicly accessible EVC network, and count towards the requirements forecast within Table 7.

6. PROPOSED EVC STRATEGY OBJECTIVES

6.1 Proposed EVC Strategy Objectives

- 6.1.1 Based on the forgoing review of national and local policies, existing provision and conditions and future forecasts of EVC requirements in Conwy the following objectives have been identified. These objectives seek to provide a framework to support the identification of a suitable system for both managing and operating EVC in Conwy.

Access & availability

- Improve access and availability to EVC within CCBC off-street car parks for all residents and visitors (e.g. commuters, business, leisure, tourists) in line with the Electric Vehicle Charging Strategy for Wales.
- Improve access and availability to EVC within the CCBC area for those households without access to off-street charging facilities.
- Improve access and availability to EVC for staff at CCBC workplaces, with potential for public access at some locations.

Quality & Inclusivity

- Provide a reliable and quality EVC experience for all users (minimum Welsh National Standards).
- Provide an inclusive EVC network in terms access and availability to protected groups.
- Provide a socially equitable network in terms of number, type and location of EVC points.

Car Park Operations

- Ensure charging types/durations are commensurate with existing car park management (i.e. long stay/short stay).
- Ensures no reduction in off-street parking revenues.

Operational

- Minimises commercial and reputational risk for CCBC.
- Provides scalable operation that can respond to changing demands and opportunities
- Provides flexible operation that can respond quickly to changing requirements and technology improvements.
- Provides a minimum cost neutral operation with the expectation of some revenue generation over the action plan period.

- 6.1.2 It is recognised that some of these objectives have opposing requirements and potential improvement schemes and measure will need to balance a range competing needs in order to deliver suitable solutions.

7. EVC MANAGEMENT MODELS

7.1 EVC Management Model Options

- 7.1.1 There has been a broad range of approaches adopted by both LAs and Regional Authorities across the UK to provide EVC infrastructure and networks in off-street car parks, on public highways and within the public realm.
- 7.1.2 Funding for EVCs for LAs in Wales is currently available through the WG Ultra Low Emission Vehicles Transformation Fund (ULEVTF) through which CCBC have a confirmed allocation of £254,150 in Financial Year (FY) 2023/24 and £250,000 for FY 2024/25. The scope of the funding has not been published by WG, but it is understood to include for initial infrastructure costs.
- 7.1.3 The principal EVC management models that have been used for LA EVC networks include the following:
- **Own & Operate** - where a single LA or group of LAs operating in either partnership or through a regional body take on the implementation, management and operation of the EVC network.
 - **Lease & Operate** – this is similar to the Own & Operate model but the LA leases the EVC equipment rather than purchasing it out right.
 - **Concession Agreements** – in which the LA enters into a contractual agreement to allow a private operator (concessionaire) to implement and operate EVCs in the LA’s off-street car parks and/or on the public highway. Concession agreements may be either fully or partially funded by the operator.
- 7.1.4 Each of these options present different benefits/disbenefits and challenges/opportunities in terms of implementing and operating the resultant EVC network that need to be considered by the implementing LA. These considerations include:
- **Charging requirements of the area** – the number, type and location of EVCs.
 - **Availability of resources** – within the LA to procure, implement, manage, operate and maintain the EVC network.
 - **Availability of funding** – to support provision of a DNO connection, implementation of below ground infrastructure and purchase/operation/maintenance of EVC equipment.
 - **Impact on car parking** – in terms of potential impacts on revenue and availability of spaces for users.
 - **Political support** – to use LA resources and assets to provide EVC together with the adoption of the preferred management model.
 - **Risk appetite** – in relation to the commercial and reputational risks the LA may be willing to accept in relation to the associated rewards that may be both financial and/or quality outcomes.

- 7.1.5 The principal EVC management model options together with their associated advantages and disadvantages are discussed in detail in the DfT/Energy Saving Trust document '*Procuring electric vehicle charge points for local authorities*' (EST, 2021) and the following sections summarise and expand on the key points.

7.2 Own & Operate

- 7.2.1 In this model, the charging infrastructure is owned by the LA who then receive all the revenue from the chargers but also cover all costs. Typically, a fee is paid to a supplier to operate and maintain the network, either as a fixed cost service or a small charge per customer transaction. However, the LA is ultimately liable for all commercial and operational risks together with ongoing maintenance and operational costs as well as any future upgrades to the network.

- 7.2.2 Table 9 summarises the key benefits and disbenefits of the Own & Operate model.

Table 9: Own & Operate Model – Benefits & Disbenefits

Benefits	Disbenefits
LA retains full ownership of the charging network and collects revenues	Availability of central and local government funds are limited
LA can determine locations	Political risk due to using of public funds
Easier procurement route as more familiar and requires less involvement from legal, procurement and property teams	Requirement for LA to cover costs for ongoing operation, maintenance, and upgrade
Likely to be quicker process	LA carries the risks of unexpected costs and the reputational damage
EVCs at LA owned shopping or leisure sites can help to increase footfall	LA carries the risk of lower revenue generation than anticipated

Source: DfT/Energy Saving Trust

- 7.2.3 In a number of cases LA have come together either through a dedicated partnership or as part of an established regional authority to deliver EVCs through an Own & Operate model. Working together offers a number of additional benefits in terms of sharing costs and commercial risks, sharing resources and incorporating sustainable energy programmes (where available) and/or other sustainability and energy saving programmes. It is noted that where LAs have opted for this approach there has generally been an established track record of collaborative working between the organisations involved (e.g. Tees Valley, Greater Manchester).

7.3 Lease & Operate

- 7.3.1 The Lease & Operate model is similar to the Own & Operate model and offers many of the same benefits in terms of the provision of a flexible and socially equitable network and the generation of revenue from EVC tariffs. Lease & Operate also has the added benefit in that a proportion of the LA's commercial risks can be reduced as the EVC equipment (and potentially) back-office operation is leased from an EVC supplier/operator for an ongoing fee typically for a minimum period of 5 years. This reduces the upfront capital costs to the LA in terms of purchase of EVC equipment, however, the costs of the below ground infrastructure and DNO connections would still remain.
- 7.3.2 The overall costs paid for the EVC equipment are likely to be higher over the term of the contract than if purchased out right but the costs would be generally fixed providing higher cost certainty. On balance, leasing has the benefit of making the delivery of the EVC network more affordable in the short term with EVC leasing costs being paid for out of charging revenues. As in Own & Operate the maintenance and service availability of the network would be the responsibility of the LA but this could be incorporated into a SLA with the EVC equipment provider.
- 7.3.3 Table 10 summarises the key benefits and disbenefits of the Lease & Operate model.

Table 10: Lease & Operate Model – Benefits & Disbenefits

Benefits	Disbenefits
LA retains revenues	LA carries the risk of lower revenue generation than anticipated
LA can choose the location, regardless of commercial viability	The whole life cost of the chargers is much higher due to ongoing leasing costs
Lower or zero capital costs	LA will never own the charging equipment
Hardware and software fault repairs included	LA will receive a lower proportion of the revenue

7.4 Concession Agreements

- 7.4.1 A concession agreement is where the LA appoints an EVC operator to who they give the rights to operate EVCs on LA owned land and/or the public highway. Within a concession agreement the EVC operator is largely responsible for the installation, management, operation and maintenance of the EVCs from which they collect and generally keep the large proportion of resultant revenues.
- 7.4.2 The key benefit to the LA of a concession agreement is the transfer of the commercial risk of operating the EVC network to the EVC operator who have the skills, resources and experience to successfully operate an EVC network.
- 7.4.3 The key disbenefits of a concession agreement is that, in transferring the risk of operating the EVC network, the LA potentially relinquishes revenue income stream together with some of their rights and abilities to manage the implementation of EVCs within their area resulting in a network that may not be socially equitable to some users.
- 7.4.4 Concession agreements fall into two categories, namely:

- **Fully funded** – where the EVC operator would provide all the finances to implement the EVC network including the DNO connections and infrastructure (e.g. ducting, chamber etc..).
- **Partially funded** – where the LA provides some of the funding to support the delivery of the EVC network with the balance being funded by the EVC operator.

- 7.4.5 For fully funded arrangements, these tend to have long durations (e.g. 10-years) in order to provide sufficient time for the operator to cover their initial investment costs and deliver income/profit to the business. In addition, these agreements tend to provide the LA with lower or no revenue and limited operational flexibility. However, being the principal stakeholder in the enterprise the EVC operator is heavily incentivised to maintain their EVC network, provide a high-quality customer service and adapt quickly to technology changes.
- 7.4.6 For partially funded arrangements, the LA investment generally involves the provision of initial infrastructure and DNO connections that, dependant on the type and number of EVCs proposed, can be a significant and variable cost. The LA may pay the EVC operator to provide the infrastructure or may deliver it as part of a separate contract for EVC accommodation works. Although this does increase risks to the LA, it is largely confined to civil engineering activities where they are likely to have greater experience and expertise.
- 7.4.7 The key benefit of partial funding is that it increases the LA's stake in the enterprise providing them more opportunity for a share of the charging revenues and greater scope/flexibility to direct the deployment of EVCs within their area. Also, by reducing the EVC operators' upfront investment costs the duration of the concession agreement can be reduced (e.g. 4-5 years) again providing greater flexibility to the LA over the medium/long term.
- 7.4.8 In terms of maintenance and technology upgrades, the EVC operator is likely to remain heavily incentivised to deliver a quality service and this may be further managed through the establishment of a SLA as part of the wider concession agreement.
- 7.4.9 In terms of revenue streams from EVCs, the LA is much more likely to be able to negotiate a revenue through a partially funded concession agreement than a fully funded one. This revenue would be subject to the contractual provisions of the concession agreement and might take the form of a profit share or a fixed connection charge or ground rent for the use of the car park spaces.
- 7.4.10 In all cases an important consideration in procuring a concession agreement is the commercial viability of the operation which will be key to attracting bidders and conducting a competitive procurement process. Engagement with prospective bidders through early market engagement is often useful in helping scope the requirements and contractual arrangements for these types of agreement.
- 7.4.11 Table 11 and Table 12 summarises the key advantages and disadvantages of the fully funded and partially funded concession agreement management models for EVC.

Table 11: Fully Funded Concession Agreement Model – Benefits & Disbenefits

Benefits	Disbenefits
Opportunity for LA to receive some EVC income from the concessionaire.	Income to LA will be low in comparison to Own & Operate, Lease & Operate and Partial Concession model options.
EVC operator is incentivised to maintain EVC equipment and network providing better quality outcomes for EVC users.	Higher LA resource requirements in developing Concession Agreement contract documentation although model documents potentially available in future through WG.
Reduced commercial risk to LA in terms of ongoing operational and maintenance costs.	Limited supply of EVC operators who may wish to enter into a concession agreement particularly if there are numerous restrictions and onerous requirements.
Opportunity for LA agree contractual terms to retain ownership of EVC infrastructure, network and equipment at end of the concession agreement period.	Risks of not completing a successful procurement exercise if EVCs are required in un-profitable locations and/or there are insufficient numbers of EVCs to balance the profitable and less profitable locations.
Opportunity for LA to agree contractual terms to ensure the concessionaire future proofs the EVC network through equipment renewals and technology upgrades.	Concessionaires may be unwilling to expand the network in the initial years of the agreement until established EVCs start generating a profitable income stream.

Source: DfT/Energy Saving Trust

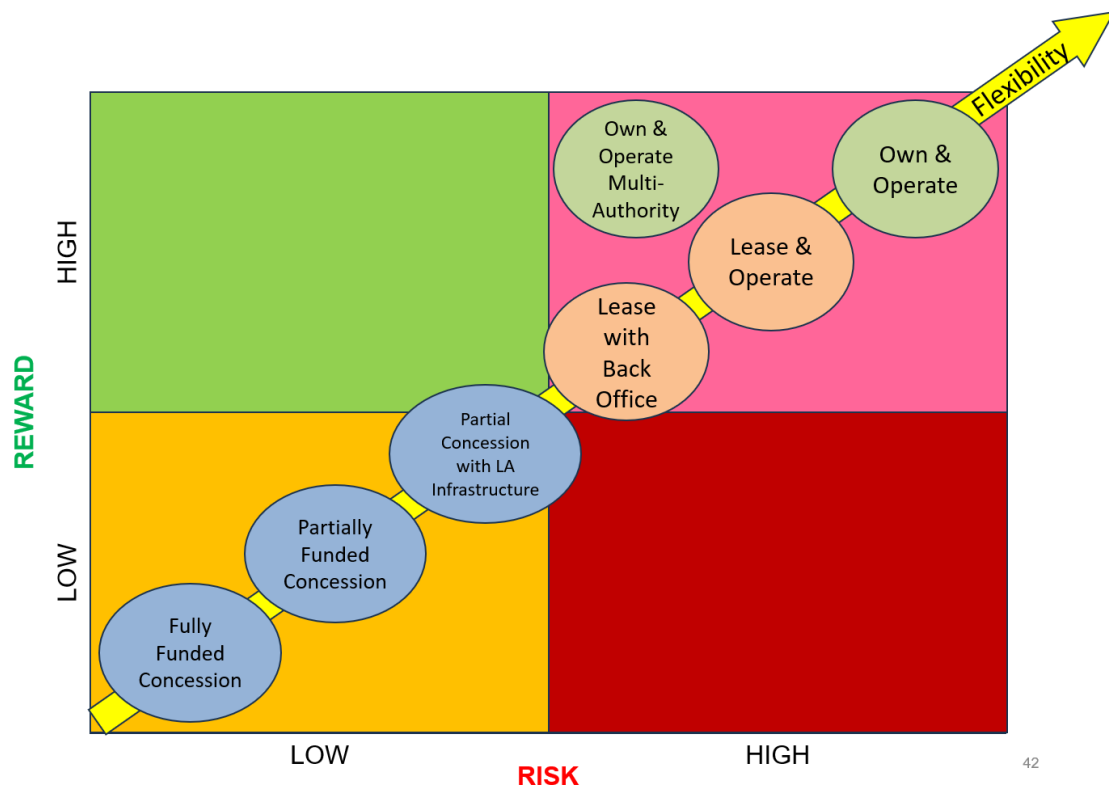
Table 12: Partially Funded Concession Agreement Model – Benefits & Disbenefits

Benefits	Disbenefits
Low or zero capital cost to the council when utilising government grants or installing in high demand locations	The council may be required to pay some capital costs if proposing a charger in a location that is likely to be low demand
The council can choose the location, regardless of commercial viability.	The amount of capital the provider is willing to invest on new chargers or network upgrades will reduce as the contract end date approaches
Short to mid-term contracts which typically include early buyout options	An income will only be provided to the council if the chargers are used and this may be lower than expected
Uncapped income potential to the council through profit share agreements	The council will receive a lower proportion of the revenue

7.5 Risk vs Reward vs Flexibility

- 7.5.1 As stated in the foregoing sections, the various EVC management models offer different levels of reward in relation to risk together with different level of flexibility which is generally related to the stake the LA has within the proposed enterprise.
- 7.5.2 Figure 9 provides a summary of risk vs reward vs flexibility for the management models considered.

Figure 9: EVC Management Models: Risk vs Reward vs Flexibility



7.6 Car Park Operations

- 7.6.1 A key consideration when providing EVCs in existing car parks is the impact of utilising a parking space as an EVC on car park operations and revenues. For EVCs in short stay car parks these need to be either fast or rapid chargers to reflect the duration of stay offered with other fast and additional slow chargers provided in longer stay car parks.
- 7.6.2 In terms of car park revenues, many LAs do not wish to see these reduced and so the overall system needs to have the capability to apply charges for both the use of the parking space and the electricity used. This might be done by simply asking drivers to pay for their parking and EVC use separately although many of the operating systems used by EVC operators are capable of incorporating parking and EVC charges on the same platform and separating out revenues for both.
- 7.6.3 Other strategies may be to provide EVCs in less utilised car parks and/or introduce a system of differential parking charges for different types of EVC with ultra-rapid/rapid EVCs attracting a premium parking charge and fast or slow EVCs having discounted parking or being free.
- 7.6.4 Regarding the control of parking spaces, WG guidance (WG, 2022) recommends that Traffic Regulation Orders (TRO) should be implemented in order to restrict non-electric vehicles from utilising EV charging bays, and also to limit the length of stay for an EV. Civil Enforcement Officers (CEOs) can be used to undertake regular checks of LA owned EV charging bays (on-street bays and car parks), which can issue Penalty Charge Notices (PCNs) following any violation of the TRO.

- 7.6.5 In addition, parking conditions should be clearly advertised on site, with penalties for exceeding the specified maximum duration of stay, enforced by PCNs.

7.7 EVC Model Appraisal

- 7.7.1 Table 13 provides an appraisal of the EVC management models considered against the proposed EVC strategy objectives detailed in Section 6 using the following 7-point scoring system:

Table 13: Appraisal of EVC Management Options Against Strategy Objectives

Proposed EV charging objective	Own & Operate - Single Authority	Own & Operate - Multiple Authority	Lease & Operate	Fully Funded Concession	Partially Funded Concession - Operator infrastructure	Partially Funded Concession - LA infrastructure
Access & availability						
Access and availability in CCBC off-street car parks.	2	2	2	1	2	2
Access and availability for households without access to off-street charging facilities.	2	2	2	0	2	2
Quality & Inclusivity						
Reliable and quality EVC experience.	1	1	1	3	3	3
Inclusive EVC network.	3	3	3	1	2	2
Socially equitable EVC network.	3	3	3	-2	1	2
Car Park Operations						
EVC commensurate with existing car park.	0	0	0	-1	0	0
No reduction in off-street parking revenues.	2	2	2	0	0	1
Operational						
Minimises commercial and reputational risk.	-3	-3	-2	3	2	2
Scaleable operation.	2	2	1	-1	1	1
Flexible operation.	2	2	1	-2	1	1
Minimum cost neutral operation.	-1	0	-1	3	2	2
Total Score	13	14	12	5	16	18

- 7.7.2 The results of the appraisal indicate that the partially funded concession agreement management model would likely provide the best balance of benefits against the EVC strategy objectives for Conwy. The benefits of adopting this management model would be maximised by CCBC providing the below ground infrastructure and DNO connections for the network.

7.8 Procurement

- 7.8.1 The DfT/Energy Saving Trust document '*Procuring electric vehicle charge points for local authorities*' (EST, 2021) provides guidance to LAs on the routes towards procurement and highlights that various frameworks are available to simplify procurement and ensure that the procurement process is compliant with legislation. Section 4 of the document outlines the contractual requirements to consider, including the sites to be included, specifications, future proofing and the evaluation criteria. The Transport Technology Forum document '*Public Procurement of Electric Vehicle Charging Infrastructure and Services*' (TTF, 2023) builds upon this, and provides a list of the information required within an Invitation to Tender (ITT) pack for the procurement of EVCs.
- 7.8.2 The National EV Insight and Support (NEVIS) service also provides guidance and support to LAs on the procurement of EVCs, including technical guidance on Heads of Terms, Technical Schedules, KPIs and tender evaluation.

7.8.3 Frameworks such as the ESPO Vehicle Charging Infrastructure framework and the Oxford Dynamic Purchasing System (DPS) for EV charging include a number of suppliers, and CCBC may be able to utilise such frameworks to procure an operator for its EVC network.

7.8.4 Examples of projects that have utilised a concession model to procure EVCs are summarised in Table 14, along with the funding source, agreed revenue arrangements and contract lengths.

Table 14: Example Concession Model Projects

Project	Funding	Responsibility for Maintenance	Revenue Arrangements	Contract Length
Gwent regional local authority EV project	Central government funding (ORCS)	Chargepoint supplier	25% profit share for local authority	5 + 3 year contract
Go Ultra Low Oxford	Central government grant	Chargepoint supplier	Most to supplier with a revenue share to the council once chargepoints are profitable	Sites leased to operators for 4 + 4 years
Go Ultra Low Nottingham	Supplier claims against central government grant. Supplier to provide any additional funds required and additional rapid chargepoints.	Chargepoint supplier	Minimum guaranteed payment and a revenue share paid by supplier to local authority	5 + 5 years
Devon County Council Deletti Project	60% ERDF funding, 40% landowner funding	Chargepoint supplier	-	Minimum 10-years
Coventry City Council	ORCS funding and 25% match funding from supplier	Chargepoint supplier	Revenue share to council from year 3	10 years, with option to extend to 15 years
Durham County Council SOSCI project	Innovate UK and chargepoint operator	-	10% revenue share to the council	Up to 12 years (7 + 5 years)

7.8.5 A suitable contract length and revenue arrangement would be subject to the tender evaluation process and agreement with the end operator.

8. PROPOSED EVC OPERATION

8.1 Potential Off-Street EVC Locations

- 8.1.1 As noted within the study objectives (see Section 6.1), the provision of EVCs within off-street car parks should be commensurate with existing car park management (i.e. long stay/short stay) and ensure no reduction in off-street parking revenues.
- 8.1.2 The provision of low speed/standard or ultra-rapid EVCs is not considered to be suitable for off-street car parks for the reasons discussed in Section **Error! Reference source not found.**, therefore fast and rapid EVCs are likely to be most appropriate for deployment across CCBC operated car parks.
- 8.1.3 Fast EVCs are ideal when vehicles are parked for a few hours and are therefore most suited to long-stay car parks where vehicles are likely to be parked for at least two hours. Rapid EVCs can provide an 80% charge in up to 40 minutes or less and are therefore more suited to short-stay car parks.
- 8.1.4 As discussed in Section 4.3, a breakdown of the tickets purchased by tariff for 15 CCBC operated car parks was provided to inform this strategy, which gives an indication of the likely EVC type required in each car park. Whilst data for the remaining 9 pay and display car parks was not available, a reasonable estimation as to the likely EVC type has been made based on the existing tariff structure, permits sold and location of each car park. A summary is provided within Table 15, with the full analysis included within Appendix 3.

Table 15: Short Stay/Long Stay Analysis and EVC Type

Car Park	No. Spaces	% Short Stay (up to 2 hours)	% Long Stay (2 to 10 hours)	% 24 hour or Overnight	Likely EVC Type
Bodlondeb, Conwy	177	61.88%	34.80%	3.32%	Rapid
Colwyn Avenue, Rhos on Sea	64	64.79%	33.16%	2.05%	Rapid
Dale Road, Llandudno	171	65.25%	31.86%	2.89%	Rapid
Douglas Road, Colwyn Bay	48	Not Available			Fast
Fernbrook Road, Penmaenmawr	76	Not Available			Rapid
Happy Valley, Llandudno (Summer)	40	49.23%	41.76%	9.00%	Fast/Rapid
Ivy Street, Colwyn Bay	41	78.35%	18.48%	3.18%	Rapid
Kinmel Beach, Kinmel Bay	48	Not Available			Rapid
Maelgwyn Road, Llandudno	134	21.33%	64.56%	14.11%	Fast
Market Place, Conwy (Summer)	45	58.25%	38.19%	3.56%	Rapid
Morfa Bach, Conwy	262	38.66%	55.73%	4.88%	Fast
Mostyn Broadway (Coach Park)	35*	Not Available			Fast
Mount Pleasant, Conwy	108	50.83%	31.46%	17.71%	Fast/Rapid
Osborne Road, Llandudno Junction	35	Not Available			Fast/Rapid
Pont y Pair, Betws y Coed	56	59.68%	24.82%	15.50%	Rapid
Princes Drive, Colwyn Bay	50	57.65%	34.13%	8.22%	Fast/Rapid

Car Park	No. Spaces	% Short Stay (up to 2 hours)	% Long Stay (2 to 10 hours)	% 24 hour or Overnight	Likely EVC Type
Sandbank Road, Towyn	56	Not Available			Rapid
Station Road, Deganwy	30	71.88%	8.18%	19.95%	Rapid
Town Hall, Llandudno	102	62.40%	29.84%	7.76%	Rapid
Vicarage Gardens, Conwy	99	71.84%	18.08%	10.08%	Rapid
York Road, Llandudno	88	16.88%	66.26%	16.86%	Fast
Watling Street, Llanrwst	45	Not Available			Rapid
Off Street Sub-Total	1,810				
Colwyn Bay Promenade (on-street)	300	Not Available			Fast
The Parade, Llandudno (on-street)	340	Not Available			Fast
Pay and Display Total	2,450				

*Mostyn Broadway proposed to be converted to 10 coach spaces and 36 car spaces

- 8.1.5 There is also the scope to provide EVCs within the 14 free car parks operated by CCBC, as this may assist in increasing parking revenue where it is fixed by a sponsorship agreement, or none is currently obtained. Given that parking charges do not apply, it is likely that parking in these locations will primarily be long-stay therefore it may be most appropriate to provide fast chargers. Many free car parks are located in settlements where pay and display car parks are not provided, and therefore the free car parks represent the only public car parks in these settlements, which include Pensarn, Abergel, Llandulas, Old Colwyn, Mochdre and Llanfairfechan.
- 8.1.6 As discussed in Section 5.2, it is likely that 259 public EVCs will be required in 2025 based on the projected number of EVs, which is an increase of +144 EVCs on the current provision. Public EVCs include all those accessible to the public, including in public car parks as well as private car parks that are publicly accessible, such as supermarkets, therefore not all additional provision will need to be within public car parks in order to meet the target.
- 8.1.7 The provision of EVCs in public car parks would however help to contribute towards achieving this target, but the locations would require careful consideration in order to ensure no reduction in parking revenues. Whilst the car parks with the great revenues are more likely to generate EV charging demand, it is important to recognise the potential for revenue loss where demand for spaces is the greatest and empty EV bays may impact this.
- 8.1.8 As discussed in Section 4.3, an income analysis of each P&D car park was undertaken to determine the car parks generating the highest amount of revenue per space. This information has been utilised alongside the total number of spaces within each car park to determine the number of spaces likely to be required in the short-term to achieve an additional 144 EV bays in 2025. The provision in each car park is largely based on a range of providing for up to 10% of spaces being for EVCs (depending on local circumstances), but with EVCs provided in even numbers given there is a ratio of 2 cars per EVCs.

Table 16: Proposed Off-Street EVC Provision (2025)

Settlement	Car Park	No. Spaces	EV Bays 2025	% Parking Provision	EVC Type
Conwy	Bodlondeb, Conwy	177	10	6%	Rapid
	Market Place, Conwy (Summer)	45	2	4%	Rapid
	Morfa Bach, Conwy	262	10	4%	Fast
	Mount Pleasant, Conwy	108	2	2%	Fast/Rapid
	Vicarage Gardens, Conwy	99	2	2%	Rapid
	Gyffin, Conwy	-	2	-	Fast
Penmaenmawr	Fernbrook Road, Penmaenmawr	76	4	5%	Rapid
	Constitution Hill, Penmaenmawr	-	2	-	Fast
Llanfairfechan	Cae Briggs, Llanfairfechan	-	2	-	Fast
	Promenade, Llanfairfechan	-	4	-	Fast
Deganwy	Station Road, Deganwy	30	2	7%	Rapid
	Platt Field, Deganwy	-	2	-	Fast
Llandudno Junction	Osborne Road, Llandudno Junction	35	2	6%	Fast/Rapid
Llandudno	Dale Road, Llandudno	171	6	4%	Rapid
	Maelgwyn Road, Llandudno	134	8	6%	Fast
	York Road, Llandudno	88	4	5%	Fast
	Town Hall, Llandudno	102	2	2%	Rapid
	The Parade, Llandudno (on-street)	340	10	3%	Fast
	Happy Valley, Llandudno (Summer)	40	2	5%	Fast/Rapid
	Mostyn Broadway	36 + 10 Coach	4 (2 car, 2 coach)	9%	Fast
Rhos on Sea	Colwyn Avenue, Rhos on Sea	64	4	6%	Rapid
Colwyn Bay	Douglas Road, Colwyn Bay	48	2	4%	Fast
	Ivy Street, Colwyn Bay	41	2	5%	Rapid
	Princes Drive, Colwyn Bay	50	2	4%	Fast/Rapid
	Colwyn Bay Promenade (on-street)	300	16	5%	Fast
Old Colwyn	Berthes Road, Old Colwyn	-	2	-	Fast
Llanddulas	Llanddulas Beach, Llanddulas	-	4	-	Fast
Abergele	Abergele Library, Abergele	-	2	-	Fast
	Water Street, Abergele	-	2	-	Fast
Pensarn	Pensarn Beach, Pensarn	-	8	-	Fast
Towyn	Sandbank Road, Towyn	56	2	4%	Rapid
Kinmel Bay	Kinmel Beach, Kinmel Bay	48	2	4%	Rapid
Betws y Coed	Pont y Pair, Betws y Coed	56	2	4%	Rapid
Llanrwst	Watling Street, Llanrwst	45	2	4%	Rapid
	Plas yn Dre, Llanrwst	-	4	-	Fast
	Gwydyr Park, Llanrwst	-	2	-	Fast
Llanfairtalhaearn	Llanfairtalhaearn	-	2	-	Fast
Mochdre	Station Road, Mochdre	-	2	-	Fast
TOTAL			144		

- 8.1.9 The delivery of the above infrastructure would result in the provision of 98 fast and 46 rapid chargers.
- 8.1.10 Whilst it is recognised that the delivery of all EVCs is likely to be challenging in the short-term, this would ensure a geographical spread of spaces across Conwy that is proportionate to the size of each settlement and the likely demand. The phasing of the delivery of the infrastructure could be phased to ensure that all key settlements have access to EVCs in the short-term, with the roll-out of the infrastructure to additional car parks in the same settlement in the long term. The EVCs in car parks that accommodate both commuter and tourist demand could be prioritised to ensure that EVCs are provided for users likely to require them the most.
- 8.1.11 The provision in Table 16 assumes that all additional provision would be delivered by CCBC, but there may be scope to reduce these figures should additional publicly available EVCs be provided by the private sector, or should additional on-street chargers that are publicly accessible be provided as discussed in Section 8.2 below. The number of EVCs in the CCBC area should continue to be monitored to ensure that the overall number of publicly accessible EVCs is in line with the WG guidance based on the number of registered EVs.
- 8.1.12 The future infrastructure within each car park (up to 2030) should be expanded in line with the public EVC requirements discussed in Section 5 and based on the recorded usage of EVCs once installed. An indication of the future EVC requirements in each car park up to 2030 has been estimated (see Appendix 7) but should be reviewed as infrastructure is installed and usage statistics obtained to allow locations with high demand to be identified and provision increased accordingly.

8.2 Potential On-Street EVC Locations

Provision for Terraced Housing

- 8.2.1 Although it is acknowledged that some terraced housing has access to off-street parking, those residing in terraced housing on average are more likely to be reliant on on-street parking. As discussed in Section 4.4, the areas with the highest densities of terraced housing are likely to see higher take ups of on-street parking solutions, such as those discussed in Section 3.2. This includes in some areas of Penmaenmawr, Colwyn Bay, Old Colwyn, Llandudno and Abergele, although there are clusters of terraced housing within many areas of Conwy.
- 8.2.2 As discussed in Section 9 below, an on-street home charging policy should be developed to identify the criteria against which households without access to off-street charging facilities will need to qualify to be able to apply for on-street home charging facilities. The policy should clearly set out the process and associated costs for providing on-street charging facilities, and the type of infrastructure (i.e. kerb channels, lamppost or bollard chargers) that may be suitable in each situation.

- 8.2.3 Although kerb channels are likely to be suitable for a number of dwellings, it is likely that a one size fits all approach will not be appropriate, and that different solutions may be required in different areas depending on the availability of kerbside parking and electrical connections. The on-street home charging policy should factor in the applicability of different solutions in varying situations.

Provision for Flats/Apartments

- 8.2.4 A different approach is likely to be needed in areas where there are high levels of flats/apartments in apartment buildings where it would be difficult to connect to the electricity supply of the household. In these locations where residents are residing in a flat/apartment reliant on on-street parking, alternative methods of charging such as lamppost/bollard charging may be more appropriate.
- 8.2.5 From initial analysis the areas that could be likely to have a higher initial take up are in Colwyn Bay and Llandudno where relatively high proportions of housing are flats/apartments.
- 8.2.6 It is noted that there is the scope for flats/apartments in these areas to utilise the off-street charging facilities in car parks and on the promenade as discussed in Section 8.1. The demand for EVCs in public car parks is likely to be much lower in evening/overnight when residential demand is likely to peak, so this would provide the opportunity to maximise the usage of the EVCs during all periods of the day. This should be a consideration of the on-street home charging policy, for example a public EVC within a five-minutes' walk of a flat/apartment may be suitable without the need to provide additional EVCs, although the WG guidance which suggests the provision of 1 EVCs per 3 vehicles that cannot charge at home would need to be taken into consideration to ensure adequate provision for all users.
- 8.2.7 It should be noted that some flats/apartment buildings have private car parking spaces where it would be the responsibility of the homeowner/landlord to implement EVCs. The UK government electric vehicle chargepoint grant fund is currently available for those living in a flat with an off-street parking space, which facilitates either a grant of either £350 or 75% off the cost to buy and install a socket, whichever amount is lower.

8.3 Charging Hubs

- 8.3.1 As discussed in Section 3.3 residential charging hubs could be provided on council-owned land to cater for the needs of EV users without access to off-street parking. This could be in addition to, or in place of other solutions such as kerb channels or lamppost/bollard chargers. An assessment of the availability of council land within the vicinity of terraced housing and flats/apartments should be undertaken to identify sites that may be suitable for residential charging hubs.

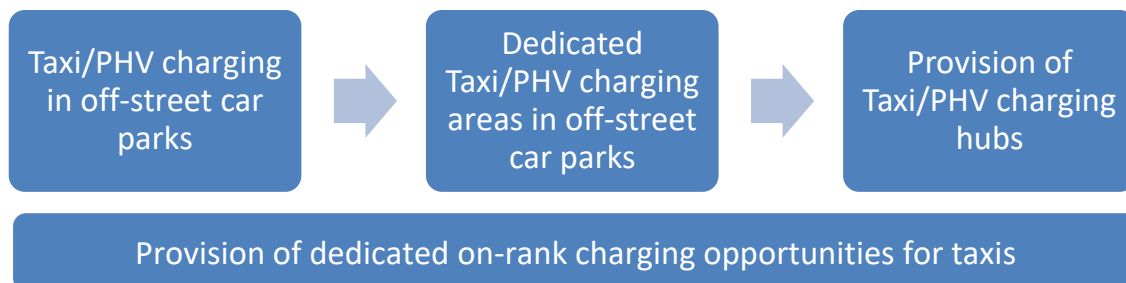
- 8.3.2 Other destination charging hubs could also be provided in key locations with a reasonable level of demand, which is most likely to be in town centre locations such as Llandudno and Conwy where available council-owned land may be at a premium. As above, an assessment of the availability of council land in key locations within these towns should be undertaken to identify suitable sites for charging hubs. It may be that some underutilised car parks could be designated as charging hubs, but they would need to be in attractive areas where their use can be encouraged over other alternatives.
- 8.3.3 Charging facilities can be provided under the same model at CCBC workplaces for council staff, with some CCBC workplace car parks may also be suitable for public access. The managing service for the workplace (e.g. school, leisure centre, office etc.) would utilise the same supplier and charging/revenue model as car parks and on-street, to ensure consistency and maximise income generation.
- 8.3.4 Charging hubs are typically provided with rapid or fast chargers, depending on the expected length of stay.

8.4 Potential Electric Taxi/PHV EVCs

- 8.4.1 As discussed in Section 4.8, there are a total of 23 taxi ranks across the CCBC area, some of which are full-time and some of which operate during certain hours only. Hackney carriages are required to be available for immediate hire when on stand, which can limit the opportunities for on-stand charging as vehicles may be unable to park for a sufficient amount of time to charge.
- 8.4.2 To avoid this, there is the potential to convert some underutilised taxi ranks within the CCBC area to waiting/charging stands, particularly full time ranks which could be converted to daytime/night-time use only and be used as a charging stand during other periods. It is understood that this system has operated successfully in Blackpool and Southport, both of which are also coastal towns frequented by tourists.
- 8.4.3 Taxis and PHVs will also be able to use the EVCs within off-street car parks and on Colwyn Bay and Llandudno promenades in the once roll out has commenced, and if underutilised by the public there is the potential to dedicate some of these bays for use by Taxis/PHVs only, at least until such a time that sufficient public demand exists.
- 8.4.4 A dedicated charging hub for taxis and PHVs could be provided in the medium to long term, although this would rely upon there being sufficient demand to justify the provision. Should sufficient on-rank and off-street charging opportunities be provided in the short-term, the take up of electric taxis and PHVs is likely to increase, at which point a hub is more likely to be justified. A hub is most likely to be suitable in towns such as Llandudno which accommodate the most taxis/PHVs, with off-street provision being available in more rural locations.
- 8.4.5 A suitable location for a taxi/PHV charging hub would need to be identified, as it is recognised that it would need to be in close proximity to ranks/areas of demand, which also tend to be in areas where parking demand is also the greatest. A dedicated taxi/PHV charging area could be incorporated within a wider charging hub (discussed in Section 8.3 above).

- 8.4.6 There is also the potential to open up CCBC depots for use by taxis and PHVs should a suitable arrangement for charging costs be agreed with operators and/or drivers.
- 8.4.7 The suggested approach to providing EVCs for taxis/PHVs is outlined in Figure 10:

Figure 10: Approach to Taxi/PHV EVCs



9. RECOMMENDATIONS & IMPLEMENTATION PLAN

9.1 Recommendations

9.1.1 The following provides a summary of the findings of this strategy and associated recommendations:

- Based on the forecast growth in EVs in Conwy and recommendations within the EV Strategy for Wales on the number of EVCs per EV, it is expected that 259 publicly available EVCs would be required in Conwy by 2025, with 736 by 2030. This includes all EVCs accessible to the public, including in public car parks, private car parks (e.g. supermarkets) and on-street locations. An additional +144 EVCs would be required in Conwy by 2025 to meet this target, but all provision need not be provided by CCBC as there is likely to be some private sector contribution towards achieving this target.
- To pump-prime provision and progress towards the 2025 target, it is recommended that CCBC seeks to provide EVCs in its off-street car parks, with the type of provision (fast/rapid) commensurate with the existing car park management structure. To ensure coverage in all settlements and provide equality, it is recommended that EVCs are provided in all CCBC operated car parks, although it is recognised that delivery would need to be phased over a period of time.
- In order to meet the objective of ensuring no reduction in off-street parking revenues, it is recommended that that EVCs customers are charged for both parking in line with the existing tariff structure and for the electricity used at the EVC.
- On-street charging provision is expected to be required for flats/apartments and terraced housing that does not have off-street parking. The provision could either be kerbside on-street chargers or shared off-street provision in public car parks. There are opportunities for residents without off-street charging provision and living near to an off-street car park to utilise the EVC provision in these car parks, especially in towns such as Llandudno and Colwyn Bay where town centre flats/apartments are located in close proximity to off-street car parks. It is recommended that an on-street home charging policy is developed to identify the criteria against which households without access to off-street charging facilities will need to qualify to be able to apply for on-street home charging facilities.
- It is recommended that EVCs for taxis and PHVs are provided within CCBC off-street car parks in the first instance, and then options to provide dedicated taxi/PHV charging hubs are investigated (subject to demand) as well as the provision of on-rank charging opportunities for taxis outside of the operational hours of the rank.
- An appraisal has identified that a partially funded concession agreement management model would likely provide the best balance of benefits against the EVC strategy objectives for Conwy. The benefits of adopting this management model would be maximised by CCBC providing the below ground infrastructure and DNO connections for the network.
- It is recommended that a single concession agreement model should be used across Council services, including for council workplace charging.

- A suitable contract length and revenue arrangement would be subject to agreement with the chosen EVC operator as part of the tender process. There are various documents which provide guidance to LAs on the procurement of EVCs, with frameworks such as ESPO and the Oxford DPS available to assist CCBC in procuring an operator.

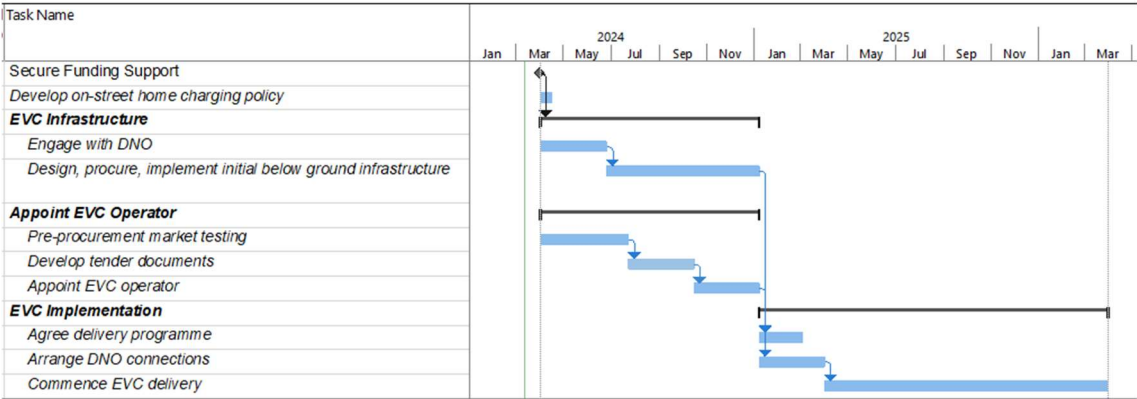
9.2 Proposed Implementation Plan

9.2.1 Based on the preceding analysis the implementation of EVC in Conwy will require CCBC to engage in a programme of activities to undertake the following:

- **Secure Funding Support:** it is understood that CCBC have already secured circa. £500,000 of funding to support delivery of EVC in Conwy through the WG Ultra Low Emission Vehicles Transformation Fund (ULEVTF) in financial years 2023/24 and 2024/25. The scope of the funding has not been published by WG, but it is understood to include for initial infrastructure costs.
- **Develop On-Street Home Charging Policy:** identifying the criteria, process and costs by which households without access to off-street charging facilities may apply for on-street home charging facilities.
- **EVC Infrastructure:**
 - Engage with DNO to identify scope/scale of infrastructure required to facilitate the electricity network connections within the off street car parks and potential on-street locations.
 - Arrange for the design, procurement and implementation of the necessary below ground infrastructure (service ducts/chambers) required to facilitate the electricity network connections.
- **Appoint EVC Operator:**
 - Undertake pre-procurement market testing with prospective EVC Operators to gauge interest in potential partial concession agreements to provide and operate EVC in off-street car parks and on-street locations in Conwy as per the EVC proposals set out in Section 8 of this report.
 - Develop concession contract tender documentation.
 - Tender concession contact.
 - Appoint EVC operator.
- **EVC Implementation:**
 - Agree delivery programme with EVC Operator.
 - Engage with DNO to arrange service connections.
 - Commence delivery of planned EVCs.

9.2.2 Figure 11 provides a proposed programme for delivering the implementation plan over the next two years (Financial Years 24/25 and 25/26).

Figure 11: Proposed Implementation Plan Programme (FY24/25 & FY 24/26)



10. REFERENCES

- CCBC (Conwy County Borough Council), 2023. Destination Conwy Management Plan 2023-2029.
- CCBC, 2022. Conwy's Local Area Energy Plan.
- CCBC, 2019a. Conwy's Decarbonisation Plan.
- CCBC, 2019b. Climate Challenge Programme.
- CCBC, 2019c. Local Development Plan 2018-2023.
- Cenex, 2022. National EV Insight & Support. [online: <https://nevis.cenex.co.uk/>].
- Deloitte, 2020. UK EV Charging Infrastructure Update (Part 2): Show Me The Money.
- DEFRA (Department for Environment, Food and Rural Affairs), 2019. Clean Air Strategy 2019.
- DESNZ (Department for Energy Security and Net Zero), 2021. Regulations: Electric Vehicle Smart Charge Points.
- DfT (Department for Transport), 2023a. Consultation outcome - The consumer experience at public chargepoints.
- DfT, 2023b. Taxis, private hire vehicles and their drivers (TAXI) – Statistical Data Set.
- DfT, 2023c. Vehicle licensing statistics.
- DfT, 2022. UK electric vehicle infrastructure strategy.
- DfT, 2021a. Decarbonising Transport: A Better, Greener Britain.
- DfT, 2021b. Official Statistics - Electric vehicle charging device statistics: April 2021.
- EC (European Commission), 2023. Energy Performance of Buildings Directive.
- EDF (EDF Energy), 2023. Electric Car Charging Points [online: <https://www.edfenergy.com/electric-cars/charging-points>] (Accessed December 2023).
- EST (Energy Saving Trust), 2023. Charging Electric Vehicles [online: <https://energysavingtrust.org.uk/advice/charging-electric-vehicles/>] (Accessed December 2023).
- EST, 2021. Procuring electric vehicle chargepoints for local authorities.
- EVGO, 2024. Types of Electric Vehicles. [online: <https://www.evgo.com/ev-drivers/types-of-evs/>] (Accessed January 2024)
- Grote, M., et. al., 2019. Locating Residential On-Street Electric Vehicle Charging Infrastructure: A Practical Methodology.
- HMG (HM Government), 2021. The Building Regulations 2010.
- KC (Kerbo Charge), 2023
- MC (Midlands Connect), 2022. Electric Vehicle Infrastructure Planning Tool.
- NAW (National Assembly for Wales), 2019. Electric Vehicle Charging Infrastructure.
- NG (National Grid), 2022. A Local Authority Guide to EVs.
- ONS (Office for National Statistics), 2024. Census Maps – Census 2021.
- ONS, 2023a. WP025 - Workplace population by method used to travel to work (2001 specification).
- ONS, 2023b. TS066 - Economic activity status.
- ONS, 2023c. TS058 - Distance travelled to work.
- ONS, 2023d. TS045 - Car or van availability.
- ONS, 2023e. TS044 - Accommodation type.

ONS, 2023f. ODWP01EW - Location of usual residence and place of work.

OZEV (Office for Zero Emission Vehicles), 2023. On-Street Residential Chargepoint Scheme.

OZEV, 2021a. Transitioning to Zero Emission Cars and Vans: 2035 Delivery Plan.

OZEV, 2021b. Rapid Charging Fund.

OZEV, 2011. Making the Connection: The Plug-In Vehicle Infrastructure Strategy.

PP (PodPoint), 2023. Cost of Charging an Electric Car.

STEAM (Scarborough Tourism Economic Activity Monitor), 2022. STEAM Final Trend Report 2011-2022 – Conwy County Borough Council.

TftN (Transport for the North), 2022. Electric Vehicle Charging Infrastructure Framework.

TTF (Transport Technology Forum), 2023. Public Procurement of Electric Vehicle Charging Infrastructure and Services.

Ubitricity, 2023. Lamppost and bollard charge point for on-street charging [online: <https://ubitricity.com/en/charging-solutions/ac-lamppost/>]

WG (Welsh Government), 2022. Net Zero Strategic Plan.

WG, 2021a. Electric Vehicle Charging Strategy for Wales.

WG, 2021b. Llwybr Newydd: The Wales Transport Strategy 2021

WG, 2018. Planning Policy Wales Edition 10.

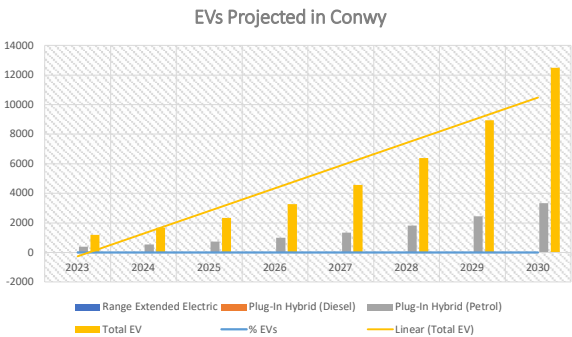
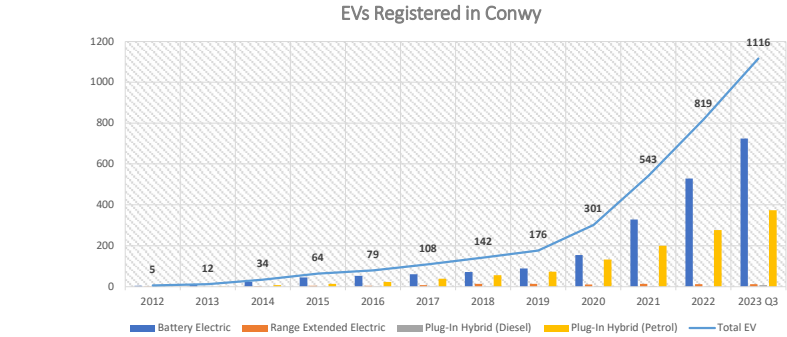
ZapMap, 2024. Zap Map Live Map [online: <https://www.zap-map.com/live/>]

ZapMap, 2023. Zapmap Price Index [online: <https://www.zap-map.com/ev-stats/charging-price-index>]

Appendix I – Registered and Forecast EVs

EVs Registered in Conwy - VEH0142

	Estimates:																											
	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023 Q3	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035			
Battery Electric	4	11	23	45	52	61	71	89	155	328	529	724	773	1116	1612	2329	3364	4858	7017	10136	14640	21146	30544	44117	63723			
Range Extended Electric	1	0	3	5	4	7	14	14	11	13	12	12	12	11	10	10	9	8	8	7	7	6	6	6	5			
Plug-In Hybrid (Diesel)	0	0	0	0	1	1	1	0	2	2	1	7	9	9	9	9	9	9	9	9	9	9	9	9	9			
Plug-In Hybrid (Petrol)	0	1	8	14	22	39	56	73	133	200	277	373	397	538	729	987	1337	1811	2454	3324	4503	6101	8265	11196	15168			
Total EV	5	12	34	64	79	108	142	176	301	543	819	1116	1190	1666	2331	3261	4564	6386	8936	12504	17497	24484	34261	47942	67086			
All Vehicles	70645	71347	73140	73956	75065	75741	76384	77131	77170	77821	78274	79353	79623	80448	81282	82124	82975	83835	84704	85582	86469	87365	88271	89185	90110			
% EVs	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.2%	0.2%	0.4%	0.7%	1.0%	1.4%	1.5%	2.1%	2.9%	4.0%	5.5%	7.6%	10.5%	14.6%	20.2%	28.0%	38.8%	53.8%	74.4%			
Public EV Charger requirement (1 per X EVs)														7	9	10	12	14	15	17	19	20	22	24	25			
EV Charger Requirement														238	259	326	380	456	596	736	921	1224	1557	1998	2683			



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023 Q3	2023 Projected
Battery Electric	-	64%	52%	49%	13%	15%	14%	20%	43%	53%	38%	27%	32%
Range Extended Electric	-	0%	100%	40%	-25%	43%	50%	0%	-27%	15%	-8%	0%	0%
Plug-In Hybrid (Diesel)	-	0%	0%	0%	0%	0%	0%	0%	100%	0%	-100%	86%	88%
Plug-In Hybrid (Petrol)	-	0%	88%	43%	36%	44%	30%	23%	45%	34%	28%	26%	30%
Plug-In Hybrid % Increase	-	0%	88%	43%	39%	43%	30%	22%	46%	33%	27%	27%	31%
% Increase	-	58%	65%	47%	19%	27%	24%	19%	42%	45%	34%	27%	31%

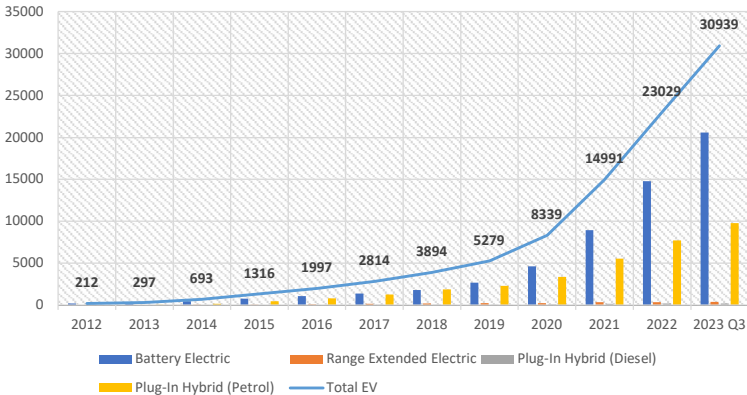
Average 2020-2022	Average 2021-2023
44%	37%
-7%	2%
0%	18%
35%	29%
35%	30%
40%	34%

EVs Registered in Wales - VEH0142

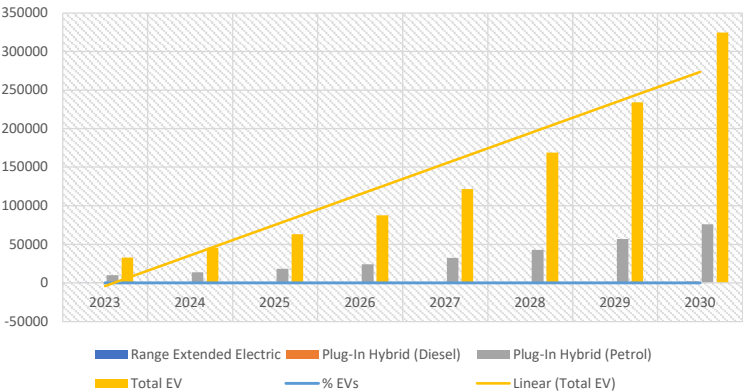
Estimates:

	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023 Q3	2023	2024	2025	2026	2027	2028	2029	2030
Battery Electric	190	254	481	781	1081	1369	1796	2673	4626	8940	14755	20590	22049	31595	45273	64874	92961	133208	190880	273520
Range Extended Electric	9	14	33	61	85	144	204	248	255	340	350	369	373.75	412	454	500	551	607	669	738
Plug-In Hybrid (Diesel)	0	0	6	9	16	29	39	51	82	149	191	201	204	275	370	500	674	910	1228	1656
Plug-In Hybrid (Petrol)	13	29	173	465	815	1272	1855	2307	3376	5562	7733	9779	10291	13688	18207	24217	32212	42847	56993	75808
Total EV	212	297	693	1316	1997	2814	3894	5279	8339	14991	23029	30939	32917	45641	63285	87749	121671	168705	233922	324351
All Vehicles	1757008	1774455	1807284	1835728	1868265	1891111	1919442	1956304	1962294	1992170	2018690	2055775	2065046	2099864	2135269	2171271	2207881	2245107	2282961	2321453
% EVs	0.0%	0.0%	0.0%	0.1%	0.1%	0.1%	0.2%	0.3%	0.4%	0.8%	1.1%	1.5%	1.6%	2.2%	3.0%	4.0%	5.5%	7.5%	10.2%	14.0%

EVs Registered in Wales



EVs Projected in Wales



	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023 Q3	2023 Projected
Battery Electric	-	25%	47%	38%	28%	21%	24%	33%	42%	48%	39%	28%	33%
Range Extended Electric	-	0%	58%	46%	28%	41%	29%	18%	3%	25%	3%	5%	6%
Plug-In Hybrid (Diesel)	-	0%	0%	0%	0%	0%	0%	0%	38%	45%	22%	5%	6%
Plug-In Hybrid (Petrol)	-	0%	83%	63%	43%	36%	31%	20%	32%	39%	28%	21%	25%
Plug-In Hybrid % Increase	-	0%	84%	62%	43%	36%	31%	20%	32%	39%	28%	21%	30%
% Increase	-	29%	57%	47%	34%	29%	28%	26%	37%	44%	35%	26%	30%

Average 2020-2022	Average 2021-2023
43%	37%
10%	10%
35%	20%
33%	28%
33%	30%
39%	34%

Appendix 2 – Current EVCPs

	Slow	Fast	Rapid	Ultra-Rapid	
Total	14	82	17	2	115

Slow	Fast	Rapid
14	82	19

Sr. No	Name of Chargepoint	Type of Charger	No. of Devices	Public access	Charging Price	Type of chargepoint	Operator	Parking charges	Method of pay	Post Code	Slow	Fast			Rapid		Ultra-Rapid
											3kW	7Kw	11kw	22kw	43kW	50kw	150kw
1	Rhys Evans Close	Fast (7Kw-type2)	1	No	Charges may apply	Home	JustCharge	Charging fees apply	JustPark App	LL30 3FJ							
2	Llandudno Bay Hotel	Fast and Rapid	6	Yes	75p/kWh	Destination Charging	Blink	Free Parking Charge apply for	Google Pay, ApplePay, All Debit and Credit cards, Amex, paypal	LL30 1BE				5		1	
3	Gwesty Links Hotel	Fast (7Kw and 22Kw)	3	Yes	75p/kWh Free for Tesla customers	Destination Charging	Tesla	Free Parking Charge apply for	Google Pay, ApplePay, All Debit and Credit cards, Amex, paypal	LL30 1BE		1		2			
4	Imperial Hotel	Fast (22kw)	3	Yes	50p/kWh	Destination Charging	Other	Charges may apply	Monta app	LL30 1AP				3			
5	St George's Hotel	Fast (7kw)	9	Yes	Charges may apply	Destination Charging	Other	£20 per night for guests	NA	LL30 2LG		9					
6	Breast Test Llandudno	Fast (7kw)	1	Yes	56p/kWh	Workplace and Destination Charging	Blink	Charges may apply	Blink app or RFID card	LL30 1QY		2					
7	Maes Dolau Caravan Park	Fast (7kw)	1	Yes	34p/kWh	Destination Charging	VendElectric	Charges may apply	VendElectric App	LL30 1SR		2					
8	Rosaire Guest House	Fast (7kw)	1	Guest	41p/kWh	Destination Charging	Other	Charges may apply	NA	LL30 2YY		1					
9	Penderyn Distillery	Fast (7kw)	3	Yes	Charges may apply	Destination Charging	Other	Charges may apply	NA	LL30 2YG		3					
10	Darwin Escapes	Rapid and Ultra-rapid	2	Yes	85p/kWh	Destination Charging	Insta Volt	Charges may apply	Credit or Debit cards Insta Volt app	LL32 8GA						2	2
11	Conwy Marina	Fast (7kw)	2	Yes	£5 Flat eq	Destination Charging	Other	Maximum 4 hrs stay No overnight stay	Purchase Credi Card from Marina reception	LL32 8GU		2					
12	The Quay hotel and Spa	Fast (11kw)	2	Guest	£35 fee	Destination Charging	Other	Charges may apply	NA	LL31 9DJ			2				
13	Anson house	Fast (7kw)	3	Yes	34p/kWh	Destination Charging	VendElectric	Free Parking	VendElectric App	LL31 9LS		5					
14	Lidl Llandudno Junction	Rapid and Ultra-rapid	1	Yes	65p/kWh	Destination and Intermediate Charging	Pod Point	Free Parking for 90 Min	Pod point app	LL31 9SH					1	2	
15	Tesco Superstore Llandudno Junction	Fast (7kw)	2	Yes	44 - 49p/kWh	Destination and Intermediate Charging	Pod Point	Free parking for 3 hrs	Pod point app	LL31 9XY		4					
16	Busking Conwy	Fast (7kw)	1	Yes	NA	Destination Charging	Other	Charges may apply	NA	LL32 8LW		1					
17	Inglewood	Slow	1	No	Home Point	Home	Zap-Home	Charges may apply	NA	LL32 8EX							
18	Sychnant Pass Country House	Slow and Fast	1	Yes	Free for residents, £5 for non-residents	Destination Charging	ZeroNet	Charges may apply	NA	LL32 8BU	1		1				
19	Craiglwyd Hall Caravan Park	Fast (7kw)	1	Yes	29p/kWh	Destination Charging	VendElectric	Charges may apply	VendElectric App	LL34 6ER		1					
20	Y Llew Coch	Fast (7kw)	1	Yes	59p/kWh	Destination Charging	Clenergy EV	Charges may apply	App	LL32 8TJ		1					
21	Bodnant Garden (National Trust)	Slow and Fast	1	Yes	Free	Destination Charging	ZeroNet	Charges may apply	App	LL28 5RE	1	1					
22	Hilton Garden Inn Snowdonia	Slow	4	Guest	Free for customers only	Workplace Charging	Other	Charges may apply	NA	LL32 8QE	8						
23	The Princes Arms Hotel	Slow	1	Guest	Free for customers only	Workplace Charging	Other	Charges may apply	NA	LL27 0JP	1						
24	Jones hsepm Ltd	Fast	1	No	Home Point	Home	Zap-Home	Charges may apply	NA	LL26 0YU			2				
25	Zip World Fforest	Fast	2	Yes	Charges may apply	Destination Charging	Other	Charges may apply	NA	LL24 0HX		2					
26	Bryn Bella Guest House	Slow and Fast	1	Guest	Free for Customer	Intermediate Charging	ZeroNet	Free parking	App	LL24 0HD	1		1				
27	Royal Oak Hotel, Holyhead Road	Fast and Rapid	2 (9 chargers)	Yes	Fast: 59p/kWh Rapid: 79p/kWh	Destination Charging	BP Pulse	£1.50/ hour	bp Pulse App	LL24 0AY		2					
28	Waterloo Hotel	Slow and Fast	1	Guest	Free for Customer	Intermediate Charging	ZeroNet	Charges may apply	App	LL24 0AR	1		1				
29	Craig-y-Oderwen Riverside Hotel	Fast	1 (2chargers)	Yes	Membership: £7.20 54p/kWh	Destination Charging	EVC	Charges may apply	EVC Plus App	LL24 0AS				2			
30	Snowdonia Glamping Holidays	Fast	1	Guest	50p/kWh	Destination Charging	Zap-Work	Charges may apply	NA	LL24 0SS			1				
31	Elen's Castle Hotel and Restaurant	Fast	2	Guest	£20	Destination Charging	Tesla	Charges may apply	NA	LL25 0EJ			2				
32	Central Promenade	Fast	1	Yes	Fast: 59p/kWh Rapid: 79p/kWh	Destination Charging	BP Pulse	£1.50/ hour	bp Pulse App	LL29 8HH				2			
33	Dingle View	Fast	1	No	Home Point	Home	Zap-Home	Charges may apply	NA	LL29 8RX							
34	9 Trem Nant Eirias	Fast	1	No	Home Point	Destination Charging	JustCharge	Charges may apply	JustPark App	LL29 8RX							
35	Zappi	Fast	1	No	Home Point	Destination Charging	Zap-Home	Charges may apply	NA	LL29 8RX							
36	Craig Y Mor Caravan Park	Fast	3	Yes	29p/kWh	Destination Charging	VendElectric	Charges may apply	VendElectric App	LL22 8HG		6					
37	Tan Yr Ogof Caravan Park	Fast	1	Yes	32p/kWh	Destination Charging	Pod Point	Charges may apply	Pod point app	LL22 8EY		2					
38	The Beach Caravan Park	Fast	1	Yes	60p/kWh	Destination Charging	VendElectric	Charges may apply	VendElectric App	LL22 8HA				2			
39	Bodlonfa	Fast	1	No	20p/kWh	Home	Zap-Home	Charges may apply	NA	LL22 8EL							
40	Threeways Garage Hyundai Abergele	Fast	1	Yes	Free for Customers	Customers Only	Hyundai Dealerships	Free parking	NA	LL22 7HT		2					
41	SF Parks Ltd	Fast	1	Yes	Free	Destination Charging	Pod Point	Charges may apply	Pod point app	LL22 9EY		1					
42	Kinnel Park East	Fast, rapid and ultra-rapid	12	Yes	Charges may apply	Destination Charging	Fuuse	Charges may apply	Fuuse app	LL18 5XE	1			4		7	
43	Kinnel Park West	Fast, rapid and ultra-rapid	6	Yes	Charges may apply	Destination Charging	Fuuse	Charges may apply	Fuuse app	LL18 5XW				2		4	
44	Ty Gwyn Caravan Park	Fast	4	Yes	55p/kWh	Destination Charging	Monta	Charges may apply	Monta app	LL22 9HA				4			

Appendix 3 – Existing Car Park Analysis

Type	Car Park	Map No.	Postcode	Total No.Spaces	% of Spaces	% Income	Permits Sold	Duration	Short Stay (Up to 2 hours)	Long Stay (2-10 hours)	night or 24	Duration Reclassified	Notes
P&D	Bodlondeb, Conwy	1	LL32 8DU	177	7.2%	0.9%	1	Any Duration	61.88%	34.80%	3.32%	Short Stay	Out of order for several months
P&D	Colwyn Avenue, Rhos on Sea	2	LL28 4NN	64	2.6%	1.4%	14	Any Duration	64.79%	33.16%	2.05%	Short Stay	
P&D	Dale Road, Llandudno	3	LL30 2BG	171	7.0%	1.1%	1	Any Duration	65.25%	31.86%	2.89%	Short Stay	
P&D	Douglas Road, Colwyn Bay	4	LL29 7PE	48	2.0%	-	17	Any Duration	-	-	-	Any Duration	
P&D	Fernbrook Road	5	LL34 6DA	76	3.1%	-	3	Any Duration	-	-	-	Any Duration	Out of order for several months
P&D	Happy Valley, Llandudno (Summer)	6	LL30 2ND	40	1.6%	4.8%	0	Long Stay	49.23%	41.76%	9.00%	Any Duration	
P&D	Ivy Street, Colwyn Bay	7	LL29 8DE	41	1.7%	1.8%	0	Any Duration	78.35%	18.48%	3.18%	Short Stay	
P&D	Kimmel Beach, Kimmel Bay	8	LL18 5EQ	48	2.0%	0.7%	2	Any Duration	-	-	-	Any Duration	
P&D	Maelgwyn Road	9	LL30 2YN	134	5.5%	3.9%	5	Any Duration	21.33%	64.56%	14.11%	Long Stay	Data from 1 of 3 machines
P&D	Market Place, Conwy (Summer)	10	LL32 8HT	45	1.8%	3.4%	0	Short Stay	58.25%	38.19%	3.56%	Short Stay	
P&D	Morfa Bach, Conwy	11	LL32 8FZ	262	10.7%	10.8%	8	Long Stay	38.66%	55.73%	4.88%	Long Stay	
P&D	Mostyn Broadway	12	LL30 1PJ	35	1.4%	0.4%	0	-	-	-	-	N/A	
P&D	Mount Pleasant, Conwy	13	LL32 8NY	108	4.4%	6.5%	44	Any Duration	50.83%	31.46%	17.71%	Short Stay	Data from 1 of 2 machines
P&D	Osborne Road, Llandudno Junction	14	LL31 9EF	35	1.4%	-	29	Any Duration	-	-	-	Any Duration	
P&D	Pont y Pair. Betws y Coed	15	LL24 0BB	56	2.3%	4.5%	3	Any Duration	59.68%	24.82%	15.50%	Short Stay	
P&D	Princes Drive, Colwyn Bay	16	LL29 8LA	50	2.0%	1.3%	63	Any Duration	57.65%	34.13%	8.22%	Short Stay	
P&D	Sandbank Road, Towyn	17	LL22 9LB	56	2.3%	0.5%	0	Any Duration	-	-	-	Any Duration	
P&D	Station Road Deganwy	18	LL31 9DA	30	1.2%	0.8%	17	Any Duration	71.88%	8.18%	19.95%	Short Stay	
P&D	Town Hall, Llandudno	19	LL302ST	102	4.2%	9.9%	0	Short Stay	62.40%	29.84%	7.76%	Short Stay	
P&D	Vicarage Gardens, Conwy	20	LL328LD	99	4.0%	19.0%	0	Short Stay	71.84%	18.08%	10.08%	Short Stay	
P&D	York Road	21	LL30 2EF	88	3.6%	3.8%	1	Any Duration	16.88%	66.26%	16.86%	Long Stay	
P&D	Watling Street, Llanrwst	22	LL26 0LS	45	1.8%	0.2%	10	Any Duration	-	-	-	Any Duration	
P&D	Colwyn Bay Promenade *on-street	23	LL29 8HH	300	12.2%	2.2%	38	Long Stay	-	-	-	Long Stay	
P&D	The Parade, Llandudno *on-street	24	LL30 2XT	340	13.9%	21.9%	0	Long Stay	-	-	-	Long Stay	
Free	Abergele Library, Abergele	25	LL22 7AH	-	-	-	-	-	-	-	-	-	
Free	Berthes Road, Old Colwyn	26	LL29 9PF	-	-	-	-	-	-	-	-	-	
Free	Cae Briggs, Llanfairfechan	27	LL33 0BD	-	-	-	-	-	-	-	-	-	
Free	Constitution Hill, Penmaenmawr	28	LL34 6BA	-	-	-	-	-	-	-	-	-	
Free	Gwydyr Park, Llanrwst	29	LL26 0PL	-	-	-	-	-	-	-	-	-	
Free	Gyffin, Conwy	30	LL32 8NN	-	-	-	-	-	-	-	-	-	
Free	Llanddulas Beach, Llanddulas	31	LL228HA	-	-	-	-	-	-	-	-	-	
Free	Llanfairtalhaearn, Llanfairtalhaearn	32	LL22 8RT	-	-	-	-	-	-	-	-	-	
Free	Pensarn Beach, Pensarn	33	LL227PP	-	-	-	-	-	-	-	-	-	
Free	Plas yn Dre, Llanrwst	34	LL30 2ST	-	-	-	-	-	-	-	-	-	
Free	Platt Field, Deganwy	35	LL31 9EX	-	-	-	-	-	-	-	-	-	
Free	Promenade, Llanfairfechan	36	LL33 0DA	-	-	-	-	-	-	-	-	-	
Free	Station Road, Mochdre	37	LL28 5DS	-	-	-	-	-	-	-	-	-	
Free	Water Street, Abergele	38	LL22 7SH	-	-	-	-	-	-	-	-	-	
			Total	2450	100%	100%	£256.00	-	55.26%	35.42%	9.27%	-	

Appendix 4 – Household Composition

LSOA	All Households	All Houses				Terraced Housing					No. Terraced Houses Owning an EV	Flat, Maisonette or Apartment						EV Proportion	1.5%
	Total	All Houses/ Bungalows	Houses with No Cars or Vans	Houses with 1 or more cars or vans	% of Houses Owning a Car*	Terraced	% Terraced	Terraced with No Cars or Vans	Terraced with 1 or more cars or vans	% of Terraced Houses Owning a Car*		Flat, Maisonette or Apartment	% Flat/Apartment	Flats with No Cars or Vans	Flats with 1 or more cars or vans	% of Flats Owning a Car	No. Flats Owning an EV		
Conwy 001A	743	333	45	288	86.5%	89	12.0%	12	77	86.5%	1	409	55.0%	205	204	49.9%	3		
Conwy 001B	1,009	358	54	304	84.9%	147	14.6%	22	125	84.9%	2	652	64.6%	269	383	58.7%	6		
Conwy 001C	769	451	65	386	85.6%	158	20.5%	23	135	85.6%	2	317	41.2%	156	161	50.8%	2		
Conwy 001D	921	384	102	282	73.4%	132	14.3%	35	97	73.4%	1	538	58.4%	276	262	48.7%	4		
Conwy 001E	786	350	111	239	68.3%	163	20.7%	52	111	68.3%	2	437	55.6%	229	208	47.6%	3		
Conwy 002A	826	710	93	617	86.9%	49	5.9%	6	43	86.9%	1	115	13.9%	33	82	71.3%	1		
Conwy 002B	753	643	155	488	75.9%	277	36.8%	67	210	75.9%	3	110	14.6%	52	58	52.7%	1		
Conwy 002C	656	404	134	270	66.8%	182	27.7%	60	122	66.8%	2	254	38.7%	176	78	30.7%	1		
Conwy 002D	749	715	111	604	84.5%	108	14.4%	17	91	84.5%	1	35	4.7%	20	15	42.9%	0		
Conwy 003A	600	566	56	510	90.1%	51	8.5%	5	46	90.1%	1	36	6.0%	7	29	80.6%	0		
Conwy 003B	645	586	41	545	93.0%	92	14.3%	6	86	93.0%	1	60	9.3%	21	39	65.0%	1		
Conwy 003C	730	693	57	636	91.8%	59	8.1%	5	54	91.8%	1	34	4.7%	9	25	73.5%	0		
Conwy 003D	760	727	74	653	89.8%	12	1.6%	1	11	89.8%	0	37	4.9%	13	24	64.9%	0		
Conwy 004A	649	356	28	328	92.1%	13	2.0%	1	12	92.1%	0	295	45.5%	79	216	73.2%	3		
Conwy 004B	836	404	35	369	91.3%	27	3.2%	2	25	91.3%	0	430	51.4%	160	270	62.8%	4		
Conwy 004C	692	493	121	372	75.5%	164	23.7%	40	124	75.5%	2	197	28.5%	97	100	50.8%	2		
Conwy 004D	777	668	75	593	88.8%	28	3.6%	3	25	88.8%	0	107	13.8%	42	65	60.7%	1		
Conwy 005A	692	675	129	546	80.9%	12	1.7%	2	10	80.9%	0	15	2.2%	4	11	73.3%	0		
Conwy 005B	638	625	51	574	91.8%	4	0.6%	0	4	91.8%	0	15	2.4%	4	11	73.3%	0		
Conwy 005C	619	598	88	510	85.3%	17	2.7%	3	14	85.3%	0	16	2.6%	10	6	37.5%	0		
Conwy 005D	606	577	76	501	86.8%	63	10.4%	8	55	86.8%	1	31	5.1%	13	18	58.1%	0		
Conwy 005E	1,057	958	130	828	86.4%	79	7.5%	11	68	86.4%	1	100	9.5%	41	59	59.0%	1		
Conwy 006A	996	914	97	817	89.4%	53	5.3%	6	47	89.4%	1	82	8.2%	21	61	74.4%	1		
Conwy 006B	849	602	70	532	88.4%	118	13.9%	14	104	88.4%	2	244	28.7%	61	183	75.0%	3		
Conwy 006C	858	809	57	752	93.0%	43	5.0%	3	40	93.0%	1	51	5.9%	9	42	82.4%	1		
Conwy 006D	1,169	1,117	158	959	85.9%	162	13.9%	23	139	85.9%	2	55	4.7%	17	38	69.1%	1		
Conwy 007A	669	560	47	513	91.6%	59	8.8%	5	54	91.6%	1	107	16.0%	46	61	57.0%	1		
Conwy 007B	653	567	134	433	76.4%	351	53.8%	83	268	76.4%	4	89	13.6%	50	39	43.8%	1		
Conwy 007C	818	272	61	211	77.6%	85	10.4%	19	66	77.6%	1	542	66.3%	321	221	40.8%	3		
Conwy 007D	1,004	271	22	249	91.9%	44	4.4%	4	40	91.9%	1	736	73.3%	322	414	56.3%	6		
Conwy 008A	948	784	110	674	86.0%	209	22.0%	29	180	86.0%	3	163	17.2%	113	50	30.7%	1		
Conwy 008B	570	477	85	392	82.2%	110	19.3%	20	90	82.2%	1	94	16.5%	51	43	45.7%	1		
Conwy 008C	560	531	12	519	97.7%	8	1.4%	0	8	97.7%	0	28	5.0%	5	23	82.1%	0		
Conwy 008D	607	583	33	550	94.3%	2	0.3%	0	2	94.3%	0	24	4.0%	5	19	79.2%	0		
Conwy 008E	664	322	19	303	94.1%	8	1.2%	0	8	94.1%	0	340	51.2%	118	222	65.3%	3		
Conwy 009A	730	652	85	567	87.0%	204	27.9%	27	177	87.0%	3	80	11.0%	35	45	56.3%	1		
Conwy 009B	579	483	74	409	84.7%	153	26.4%	23	130	84.7%	2	96	16.6%	38	58	60.4%	1		
Conwy 009C	649	481	73	408	84.8%	53	8.2%	8	45	84.8%	1	169	26.0%	62	107	63.3%	2		
Conwy 009D	744	700	71	629	89.9%	130	17.5%	13	117	89.9%	2	42	5.6%	22	20	47.6%	0		
Conwy 009E	524	508	124	384	75.6%	280	53.4%	68	212	75.6%	3	17	3.2%	6	11	64.7%	0		
Conwy 009F	547	526	45	481	91.4%	37	6.8%	3	34	91.4%	1	20	3.7%	5	15	75.0%	0		
Conwy 010B	785	697	87	610	87.5%	141	18.0%	18	123	87.5%	2	86	11.0%	39	47	54.7%	1		
Conwy 010C	817	791	110	681	86.1%	3	0.4%	0	3	86.1%	0	26	3.2%	11	15	57.7%	0		
Conwy 010D	729	712	71	641	90.0%	2	0.3%	0	2	90.0%	0	17	2.3%	8	9	52.9%	0		
Conwy 010E	890	676	160	516	76.3%	245	27.5%	58	187	76.3%	3	212	23.8%	131	81	38.2%	1		
Conwy 010F	922	872	85	787	90.3%	88	9.5%	9	79	90.3%	1	50	5.4%	18	32	64.0%	0		
Conwy 010G	591	585	83	502	85.8%	47	8.0%	7	40	85.8%	1	6	1.0%	4	2	33.3%	0		
Conwy 010H	639	382	52	330	86.4%	5	0.8%	1	4	86.4%	0	257	40.2%	175	82	31.9%	1		
Conwy 011C	846	787	125	662	84.1%	132	15.6%	21	111	84.1%	2	64	7.6%	31	33	51.6%	0		
Conwy 011D	710	564	105	459	81.4%	180	25.4%	34	146	81.4%	2	148	20.8%	64	84	56.8%	1		
Conwy 011E	617	597	61	536	89.8%	69	11.2%	7	62	89.8%	1	18	2.9%	2	16	88.9%	0		
Conwy 011F	999	964	75	889	92.2%	90	9.0%	7	83	92.2%	1	31	3.1%	9	22	71.0%	0		
Conwy 012A	879	855	64	791	92.5%	126	14.3%	9	117	92.5%	2	24	2.7%	5	19	79.2%	0		
Conwy 012B	531	461	77	384	83.3%	163	30.7%	27	136	83.3%	2	68	12.8%	26	42	61.8%	1		
Conwy 012C	742	585	99	486	83.1%	193	26.0%	33	160	83.1%	2	156	21.0%	59	97	62.2%	1		
Conwy 012D	696	648	71	577	89.0%	74	10.6%	8	66	89.0%	1	47	6.8%	6	41	87.2%	1		
Conwy 013A	827	621	86	535	86.2%	217	26.2%	30	187	86.2%	3	207	25.0%	101	106	51.2%	2		
Conwy 013B	710	693	86	607	87.6%	97	13.7%	12	85	87.6%	1	18	2.5%	2	16	88.9%	0		
Conwy 013C	819	768	81	687	89.5%	110	13.4%	12	98	89.5%	1	49	6.0%	21	28	57.1%	0		
Conwy 013D	689	502	66	436	86.9%	99	14.4%	13	86	86.9%	1	185	26.9%	90	95	51.4%	1		
Conwy 013E	633	520	95	425	81.7%	364	57.5%	67	298	81.7%	4	115	18.2%	39	76	66.1%	1		
Conwy 014A	851	820	61	759	92.6%	66	7.8%	5	61	92.6%	1	32	3.8%	0	32	100.0%	0		
Conwy 014B	579	569	32	537	94.4%	46	7.9%	3	43	94.4%	1	7	1.2%	1	6	85.7%	0		
Conwy 014C	757	746	24	722	96.8%	30	4.0%	1	29	96.8%	0	9	1.2%	1	8	88.9%	0		
Conwy 014D	605	589	54	535	90.8%	78	12.9%	7	71	90.8%	1	13	2.1%	2	11	84.6%	0		
Conwy 015A	517	495	38	457	92.3%	82	15.9%	6	76	92.3%	1	22	4.3%	6	16	72.7%	0		
Conwy 015B	946	740	123	617	83.4%	166	17.5%	28	138	83.4%	2	203	21.5%	98	105	51.7%	2		
Conwy 015C	625	616	35	581	94.3%	43	6.9%	2	41	94.3%	1	8	1.3%	0	8	100.0%	0		
Conwy 015D	452	404	62	342	84.7%	184	40.7%	28	156	84.7%	2	43	9.5%	16	27	62.8%	0		
Conwy 015E	546	521	62	459	88.1%	63	11.5%	7	56	88.1%	1	27	4.9%	8	19	70.4%	0		
Conwy 015F	638	626	35	591	94.4%	142	22.3%	8	134	94.4%	2	11	1.7%	1	10	90.9%	0		

*Data not available for terraced housing averaged from data for whole houses/bungalows

Appendix 5 – Origin Destination Data

LA Code	LA of Residence	LA Code	Workplace LA	Count	Proportion
W06000003	Conwy	W06000003	Conwy	19920	-
W06000004	Denbighshire	W06000003	Conwy	2951	48%
W06000002	Gwynedd	W06000003	Conwy	1283	21%
W06000005	Flintshire	W06000003	Conwy	657	11%
W06000001	Isle of Anglesey	W06000003	Conwy	562	9%
W06000006	Wrexham	W06000003	Conwy	116	2%
E06000050	Cheshire West and Chester	W06000003	Conwy	114	2%
E08000015	Wirral	W06000003	Conwy	38	1%
E08000003	Manchester	W06000003	Conwy	24	0%
E06000049	Cheshire East	W06000003	Conwy	18	0%
E08000012	Liverpool	W06000003	Conwy	18	0%
E06000051	Shropshire	W06000003	Conwy	17	0%
E08000025	Birmingham	W06000003	Conwy	16	0%
W060000008	Ceredigion	W06000003	Conwy	16	0%
E08000004	Oldham	W06000003	Conwy	15	0%
E08000006	Salford	W06000003	Conwy	14	0%
E08000014	Sefton	W06000003	Conwy	12	0%
W06000010	Carmarthenshire	W06000003	Conwy	12	0%
E06000008	Blackburn with Darwen	W06000003	Conwy	10	0%
E06000007	Warrington	W06000003	Conwy	8	0%
E06000047	County Durham	W06000003	Conwy	8	0%
W060000018	Caerphilly	W06000003	Conwy	8	0%
E06000020	Telford and Wrekin	W06000003	Conwy	6	0%
W060000016	Rhondda Cynon Taf	W06000003	Conwy	6	0%
E06000006	Halton	W06000003	Conwy	5	0%
E08000010	Wigan	W06000003	Conwy	5	0%
E08000035	Leeds	W06000003	Conwy	5	0%
W060000011	Swansea	W06000003	Conwy	5	0%
E060000004	Stockton-on-Tees	W06000003	Conwy	4	0%
E06000044	Portsmouth	W06000003	Conwy	4	0%
E06000060	Buckinghamshire	W06000003	Conwy	4	0%
E07000121	Lancaster	W06000003	Conwy	4	0%
E07000165	Harrogate	W06000003	Conwy	4	0%
E07000189	South Somerset	W06000003	Conwy	4	0%
E07000195	Newcastle-under-Lyme	W06000003	Conwy	4	0%
W060000009	Pembrokeshire	W06000003	Conwy	4	0%
W060000012	Neath Port Talbot	W06000003	Conwy	4	0%
W060000013	Bridgend	W06000003	Conwy	4	0%
W060000015	Cardiff	W06000003	Conwy	4	0%
W060000023	Powys	W06000003	Conwy	4	0%
E07000127	West Lancashire	W06000003	Conwy	3	0%
E07000194	Lichfield	W06000003	Conwy	3	0%
E07000198	Staffordshire Moorlands	W06000003	Conwy	3	0%
E08000001	Bolton	W06000003	Conwy	3	0%
E08000007	Stockport	W06000003	Conwy	3	0%
E08000011	Knowsley	W06000003	Conwy	3	0%
E08000013	St. Helens	W06000003	Conwy	3	0%
E08000019	Sheffield	W06000003	Conwy	3	0%
E09000021	Kingston upon Thames	W06000003	Conwy	3	0%
W060000024	Merthyr Tydfil	W06000003	Conwy	3	0%
E06000016	Leicester	W06000003	Conwy	2	0%
E07000040	East Devon	W06000003	Conwy	2	0%
E07000073	Harlow	W06000003	Conwy	2	0%
E07000123	Preston	W06000003	Conwy	2	0%
E07000126	South Ribble	W06000003	Conwy	2	0%
E07000172	Broxtove	W06000003	Conwy	2	0%
E07000178	Oxford	W06000003	Conwy	2	0%
E08000002	Bury	W06000003	Conwy	2	0%
E08000009	Trafford	W06000003	Conwy	2	0%
E08000027	Dudley	W06000003	Conwy	2	0%
E08000028	Sandwell	W06000003	Conwy	2	0%
E08000030	Walsall	W06000003	Conwy	2	0%
E09000022	Lambeth	W06000003	Conwy	2	0%
E09000024	Merton	W06000003	Conwy	2	0%
E09000028	Southwark	W06000003	Conwy	2	0%
E09000031	Waltham Forest	W06000003	Conwy	2	0%
W060000021	Monmouthshire	W06000003	Conwy	2	0%
E06000001	Hartlepool	W06000003	Conwy	1	0%
E06000005	Darlington	W06000003	Conwy	1	0%
E06000011	East Riding of Yorkshire	W06000003	Conwy	1	0%
E06000012	North East Lincolnshire	W06000003	Conwy	1	0%
E06000021	Stoke-on-Trent	W06000003	Conwy	1	0%
E06000039	Slough	W06000003	Conwy	1	0%
E06000046	Isle of Wight	W06000003	Conwy	1	0%
E06000059	Dorset	W06000003	Conwy	1	0%
E06000061	North Northamptonshire	W06000003	Conwy	1	0%
E06000062	West Northamptonshire	W06000003	Conwy	1	0%
E07000031	South Lakeland	W06000003	Conwy	1	0%
E07000038	North East Derbyshire	W06000003	Conwy	1	0%
E07000047	West Devon	W06000003	Conwy	1	0%
E07000117	Burnley	W06000003	Conwy	1	0%
E07000118	Chorley	W06000003	Conwy	1	0%
E07000119	Fylde	W06000003	Conwy	1	0%
E07000120	Hyndburn	W06000003	Conwy	1	0%
E07000130	Charnwood	W06000003	Conwy	1	0%
E07000133	Melton	W06000003	Conwy	1	0%
E07000138	Lincoln	W06000003	Conwy	1	0%
E07000146	King's Lynn and West Norfolk	W06000003	Conwy	1	0%
E07000147	North Norfolk	W06000003	Conwy	1	0%
E07000149	South Norfolk	W06000003	Conwy	1	0%
E07000168	Scarborough	W06000003	Conwy	1	0%
E07000176	Rushcliffe	W06000003	Conwy	1	0%
E07000220	Rugby	W06000003	Conwy	1	0%
E07000222	Warwick	W06000003	Conwy	1	0%
E08000017	Doncaster	W06000003	Conwy	1	0%
E08000031	Wolverhampton	W06000003	Conwy	1	0%
E09000008	Croydon	W06000003	Conwy	1	0%
E09000025	Newham	W06000003	Conwy	1	0%
W060000014	Vale of Glamorgan	W06000003	Conwy	1	0%
W060000019	Blaenau Gwent	W06000003	Conwy	1	0%
W060000020	Torfaen	W06000003	Conwy	1	0%
W060000022	Newport	W06000003	Conwy	1	0%
				6096	548.64

Destination	Origin	Count	Approx. Distance	Proportion
Conwy	Conwy	19920	1-40km	
Conwy	Denbighshire	2951	1-70km	48.4%
Conwy	Gwynedd	1283	4-100km	21.0%
Conwy	Flintshire	657	70km	10.8%
Conwy	Isle of Anglesey	562	30-60km	9.2%
Conwy	Wrexham	116	85km	1.9%
Conwy	Cheshire West and C	114	70km	1.9%
Conwy	Wirral	38	90km	0.6%
Conwy	Manchester	24	130km	0.4%
Conwy	Cheshire East	18	80km	0.3%
Conwy	Liverpool	18	120km	0.3%

Appendix 6 – Extracted Tourism Data

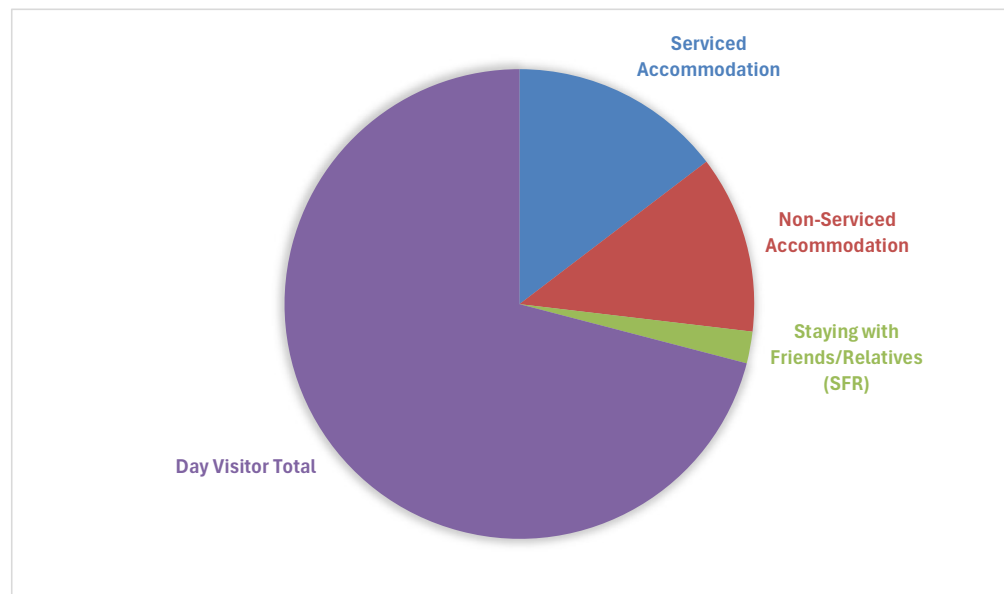
Year - Raw Extracted Data	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Serviced Accommodation (Millions)	1.156	1.076	1.156	1.177	1.198	1.043	1.014	1.02	1.017	0.412	0.649	1.04
Non-Serviced Accommodation (Thousands)	966	1,151.70	1,175.30	1,161.10	1,200.20	1,211.50	1,294.30	1,327.20	1,373.60	458.5	916.8	1,355.10
Staying with Friends/Relatives (SFR) (Thousands)	171.3	177.9	178.4	178.8	179.6	179.5	180	180.5	181	45	47.1	177.3
Staying Visitor (Millions)	2.294	2.405	2.509	2.517	2.578	2.434	2.488	2.528	2.572	0.915	1.613	2.573
Day Visitor (Millions)	5.599	5.572	5.967	6.28	6.71	6.749	6.801	6.914	7.22	2.585	6.263	6.899
Total Visitors (Millions)	7.893	7.977	8.476	8.797	9.288	9.183	9.29	9.441	9.792	3.5	7.876	9.472

Year - Revised Data	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Serviced Accommodation (Millions)	1.156	1.076	1.156	1.177	1.198	1.043	1.014	1.02	1.017	0.412	0.649	1.04
Non-Serviced Accommodation (Millions)	0.966	1.1517	1.1753	1.1611	1.2002	1.2115	1.2943	1.3272	1.3736	0.4585	0.9168	1.3551
Staying with Friends/Relatives (SFR) (Millions)	0.1713	0.1779	0.1784	0.1788	0.1796	0.1795	0.18	0.1805	0.181	0.045	0.0471	0.1773
Staying Visitor Total (Millions)	2.294	2.405	2.509	2.517	2.578	2.434	2.488	2.528	2.572	0.915	1.613	2.573
Day Visitor Total (Millions)	5.599	5.572	5.967	6.28	6.71	6.749	6.801	6.914	7.22	2.585	6.263	6.899
Total Visitors (Millions)	7.893	7.977	8.476	8.797	9.288	9.183	9.29	9.441	9.792	3.5	7.876	9.472

Year - Combined Data	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020	2021	2022
Staying Visitors (Millions)	2.294	2.405	2.509	2.517	2.578	2.434	2.488	2.528	2.572	0.915	1.613	2.573
Day Visitors (Millions)	5.599	5.572	5.967	6.28	6.71	6.749	6.801	6.914	7.22	2.585	6.263	6.899
Total Visitors (Millions)	7.893	7.977	8.476	8.797	9.288	9.183	9.29	9.441	9.792	3.5	7.876	9.472

Staying Visitors and Day Visitors	2022
Serviced Accommodation	1.156
Non-Serviced Accommodation	0.966
Staying with Friends/Relatives (SFR)	0.1713
Day Visitor Total	5.599

Data Source: STEAM, 2022



Appendix 7 – Projected Off-Street EVC Requirements 2025-2030

Settlement	Car Park	No. Spaces	EVC Type	2025		2026		2027		2028		2029		2030	
				EV Bays 2025	% Parking Provision	EV Bays 2025	% Parking Provision	EV Bays 2025	% Parking Provision	EV Bays 2025	% Parking Provision	EV Bays 2025	% Parking Provision	EV Bays 2025	% Parking Provision
Conwy	Bodlondeb, Conwy	177	Rapid	10	6%	18	10%	30	17%	30	17%	30	17%	38	22%
	Market Place, Conwy (Summer)	45	Rapid	2	4%	2	4%	2	4%	10	22%	10	22%	10	22%
	Morfa Bach, Conwy	262	Fast	10	4%	26	10%	26	10%	52	20%	52	20%	52	20%
	Mount Pleasant, Conwy	108	Fast/Rapid	2	2%	2	2%	6	6%	6	6%	6	6%	22	20%
	Vicarage Gardens, Conwy	99	Rapid	2	2%	2	2%	2	2%	2	2%	2	2%	20	20%
	Gyffin, Conwy	-	Fast	2	-	2	-	2	-	2	-	2	-	4	-
Penmaenmawr	Fernbrook Road, Penmaenmawr	76	Rapid	4	5%	4	5%	8	10%	8	10%	16	21%	16	21%
	Constitution Hill, Penmaenmawr	-	Fast	2	-	2	-	2	-	2	-	2	-	2	-
Llanfairfechan	Cae Briggs, Llanfairfechan	-	Fast	2	-	2	-	2	-	4	-	4	-	4	-
	Promenade, Llanfairfechan	-	Fast	4	-	10	-	10	-	10	-	20	-	20	-
Deganwy	Station Road, Deganwy	30	Rapid	2	7%	2	7%	6	20%	6	20%	6	20%	6	20%
	Platt Field, Deganwy	-	Fast	2	-	2	-	2	-	2	-	6	-	6	-
Llandudno Junction	Osborne Road, Llandudno Junction	35	Fast/Rapid	2	6%	2	6%	2	6%	2	6%	8	22%	8	22%
Llandudno	Dale Road, Llandudno	171	Rapid	6	4%	6	4%	10	6%	10	6%	34	20%	34	20%
	Maelgwyn Road, Llandudno	134	Fast	8	6%	16	12%	16	12%	16	12%	16	12%	28	21%
	York Road, Llandudno	88	Fast	4	5%	4	5%	4	5%	18	20%	18	20%	18	20%
	Town Hall, Llandudno	102	Rapid	2	2%	2	2%	6	6%	6	6%	6	6%	20	20%
	The Parade, Llandudno (on-street)	340	Fast	10	3%	20	6%	24	7%	34	10%	54	16%	68	20%
	Happy Valley, Llandudno (Summer)	40	Fast/Rapid	2	5%	2	5%	2	5%	2	5%	2	5%	6	15%
	Mostyn Broadway	46	Fast	4	9%	4	9%	4	9%	10	21%	10	21%	10	21%
Rhos on Sea	Colwyn Avenue, Rhos on Sea	64	Rapid	4	6%	4	6%	4	6%	4	6%	14	22%	14	22%
Colwyn Bay	Douglas Road, Colwyn Bay	48	Fast	2	4%	2	4%	2	4%	4	8%	4	8%	10	20%
	Ivy Street, Colwyn Bay	41	Rapid	2	5%	2	5%	4	10%	4	10%	4	10%	8	20%
	Princes Drive, Colwyn Bay	50	Fast/Rapid	2	4%	2	4%	4	8%	4	8%	4	8%	10	20%
	Colwyn Bay Promenade (on-street)	300	Fast	16	5%	24	8%	30	10%	36	12%	48	16%	60	20%
Old Colwyn	Berthes Road, Old Colwyn	-	Fast	2	-	2	-	2	-	2	-	4	-	4	-
Llanddulas	Llanddulas Beach, Llanddulas	-	Fast	4	-	4	-	4	-	4	-	10	-	10	-
Abergele	Abergele Library, Abergele	-	Fast	2	-	2	-	2	-	2	-	2	-	6	-
	Water Street, Abergele	-	Fast	2	-	2	-	2	-	2	-	4	-	4	-
Pensarn	Pensarn Beach, Pensarn	-	Fast	8	-	12	-	12	-	12	-	24	-	24	-
Towyn	Sandbank Road, Towyn	56	Rapid	2	4%	2	4%	2	4%	2	4%	2	4%	12	21%
Kinmel Bay	Kinmel Beach, Kinmel Bay	48	Rapid	2	4%	2	4%	2	4%	2	4%	2	4%	10	20%
Betws y Coed	Pont y Pair, Betws y Coed	56	Rapid	2	4%	4	8%	4	8%	4	8%	12	21%	12	21%
Llanrwst	Watling Street, Llanrwst	45	Rapid	2	4%	2	4%	10	8%	10	22%	10	22%	10	22%
	Plas yn Dre, Llanrwst	-	Fast	4	-	8	-	8	-	8	-	20	-	20	-
	Gwydyr Park, Llanrwst	-	Fast	2	-	2	-	2	-	2	-	2	-	8	-
Llanfairtalhaearn	Llanfairtalhaearn	-	Fast	2	-	2	-	2	-	4	-	4	-	4	-
Mochdre	Station Road, Mochdre	-	Fast	2	-	2	-	2	-	2	-	6	-	6	-
TOTAL				144		211		265		341		480		622	