



Llywodraeth Cymru
Welsh Government

Electric Vehicle Charging Infrastructure - Welsh National Standards

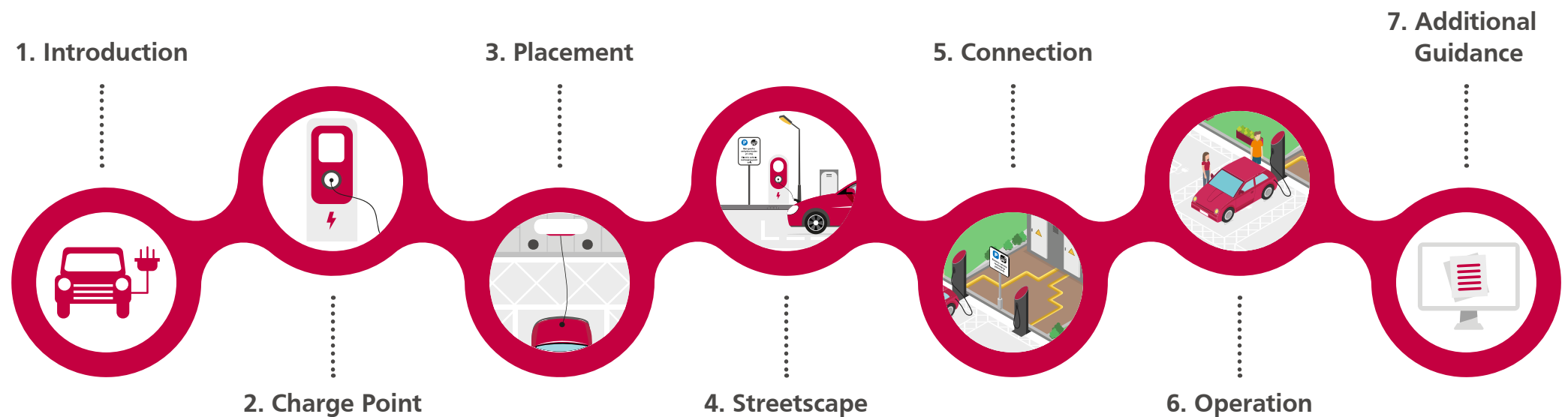


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Mae'r ddogfen hon ar gael yn Gymraeg hefyd
This document is also available in Welsh

Rydym yn croesawu gohebiaeth a galwadau ffôn yn Gymraeg
We welcome correspondence and telephone calls in Welsh

Contents overview



Annex A: Key messages contains a useful checklist summary of the key messages from each section.

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1. Introduction

This guide is intended for public sector organisations, community enterprises, and delivery partners involved in deploying public electric vehicle charging infrastructure in Wales. It provides good practice standards for safe, accessible, and reliable public charging for electric vehicles in Wales.

This guidance contains recommendations apart from those sections using 'must' which indicates a legal requirement. This document should be read in conjunction with the relevant linked legislation.

1.1 National charging strategies and policy

In April 2021, Welsh Government published the [Electric Vehicle Charging Strategy for Wales](#) which established an ambitious vision for electric vehicle charging infrastructure

"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."

This vision, is supported by national strategies and policies that provide context and support the strategic case for the installation of charging infrastructure:

- [Llwybr Newydd A New Wales Transport Strategy 2021](#)
- [Net Zero Wales Carbon Budget 2 \(2021\)](#)
- [Future Wales: The National Plan 2040 \(2021\)](#)
- [Prosperity for all: a low carbon Wales \(2019\)](#)

Whilst our aim is to reduce transport related carbon emissions as much as possible through modal shift towards public transport, walking and cycling, there will remain a significant proportion of journeys for which cars and vans are the only or best option. It is essential for our carbon reduction commitments that these remaining journeys are moved to ultra low emission vehicles.

The primary policy levers supporting the uptake of electric vehicles in Wales are set by UK government. The forthcoming 2030 ban on the sale of diesel and petrol cars and vans is a key driver in accelerating the uptake of electric vehicles, which requires suitable charging infrastructure to be in place. The Department for Transport (DfT) CO2 regulatory framework mandates vehicle manufacturers to implement the ban.

UK Government grants are administered by the Office of Zero Emissions Vehicles (OZEV) for both the purchase of electric cars and vans and for the installation of home, workplace and on-street charging.

1.2 Emerging policy, guidance, and standards

Policy, funding and best practice from the Government is rapidly evolving so public organisations should keep informed of any developments.

Consider subscribing to relevant feeds on GOV.UK e.g. [OZEV weekly updates](#)

Welsh Government is investing substantial sums of public funding in the provision of electric vehicle charging infrastructure. It has done this as part of its plans to develop sustainable transport networks in Wales. It is therefore essential that new electric vehicle infrastructure does not hinder the operation and development of the most sustainable transport modes, active travel and public transport.

Date	Author	Title	Description
2022	Office for Zero Emission Vehicles and IET	EV infrastructure technical guidance for local authorities	A guide to give Local Authority officers involved with EV charging projects access to the necessary information to make the right decisions when deploying infrastructure.
2022	British Standards Institute (BSI) in partnership with Motability	Electric vehicles - Accessible charging - Specification (PAS 1899)	Requirements for the provision of accessible public charge points for electric-powered vehicles to all potential users, including disabled people and older people.
2022	Department for Transport	Consumer Experience at Public Chargepoints	Regulation to be laid before parliament to mandate: • a minimum payment method • a consistent pricing metric across the public network • industry-led payment roaming • open and some dynamic data made available to consumers • a 99% reliable charging network across all rapid charge points

1.3 Project planning

Local charging needs, customer behaviours and demand* should be understood before procuring charge points. Factors that can influence charging needs and behaviours in a local area include:



Nature of vehicle use (e.g. daily mileage, routes and frequency)



Cost, convenience and quality of public charging services



Accessibility needs of customers



Proximity of charge points to services and amenities



The battery range and charging capabilities of the vehicles used



Safety and perception of safety when using public charging



Availability of private charging options (e.g. home charging)



Customers' intended dwell time at different charging locations

When deciding where to install charge points, having a wider strategy in place helps to ensure that investments in charge points provide the maximum benefit to society. This wider strategy can be informed by undertaking current and future demand modelling*. Electric vehicle statistics that can be used to create demand models are available from:

- ✚ [Government Electric vehicle charging device statistics](#)
- ✚ [National Grid Future Energy Scenarios](#)
- ✚ [National Chargepoint Registry \(NCR\)](#)

*Demand modelling should account for fluctuations due to tourism.

1.4 Roles and responsibilities

Many stakeholders are involved in planning, procuring and installing public charge points. Collaboration between stakeholders is therefore essential for efficient and effective delivery of charge points.

Organisations planning the delivery of charge points should appoint a responsible officer or team to coordinate and oversee infrastructure rollout.

Different procurement methods require varying levels of responsibility and involvement from public organisations. The figure to the right illustrates the provision of charging infrastructure where a public sector organisation has a key role to facilitate delivery.

There are currently circumstances where little or no public sector involvement is required, such as high utilisation locations for rapid charging. It is widely accepted however that public sector involvement is necessary in many cases to provide leadership and policy direction, or facilitate installations either with funding or access to land.

As the market matures it is expected that public sector organisations will have a decreasing role in charge point rollout. Existing publicly owned and new privately owned charge points installed on publicly owned land will continue to be monitored by public organisations.



Internal and external stakeholders at different stages of charge point rollout



2. Charge point

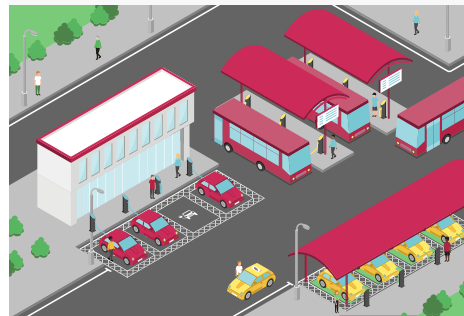
2.1 Locations

For electric vehicles there is not a 'one-size-fits-all' solution as we currently have with fuelling stations. The [Electric Vehicle Charging Strategy for Wales](#) outlined six charge point solutions or location types.

Charge point operators currently see the highest average usage at charging hubs. Users appear to be attracted to locations that have multiple charge points available and where queuing is not likely to be necessary.

Home charging is not featured within this guidance as this is not usually available to the public. The broader term 'off-street' charging, is used for all locations other than 'home' or 'on-street' charging.

Hub



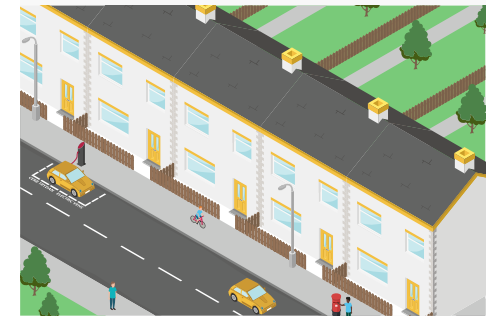
Provided for a range of users at centralised or out-of-town locations with a mix of charging types to service different user needs.

Destination



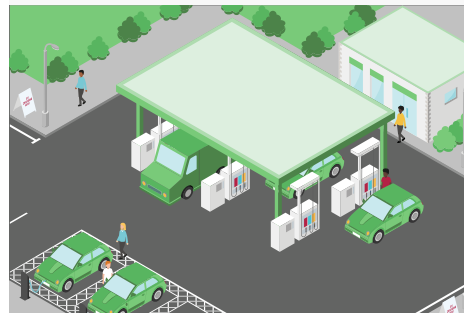
Provided at destinations where the user may park for a number of hours, e.g. gym, cinema or shopping centres.

On Street



Provided for users with no off-street parking, such as terraced housing or visitors to destinations where on-street parking is available.

On Route



Provided for users looking to quickly top up midway through a journey, for example at motorway service areas.

Workplace



Provided in private workplace car parks to charge electric vehicle for employees and business fleets.

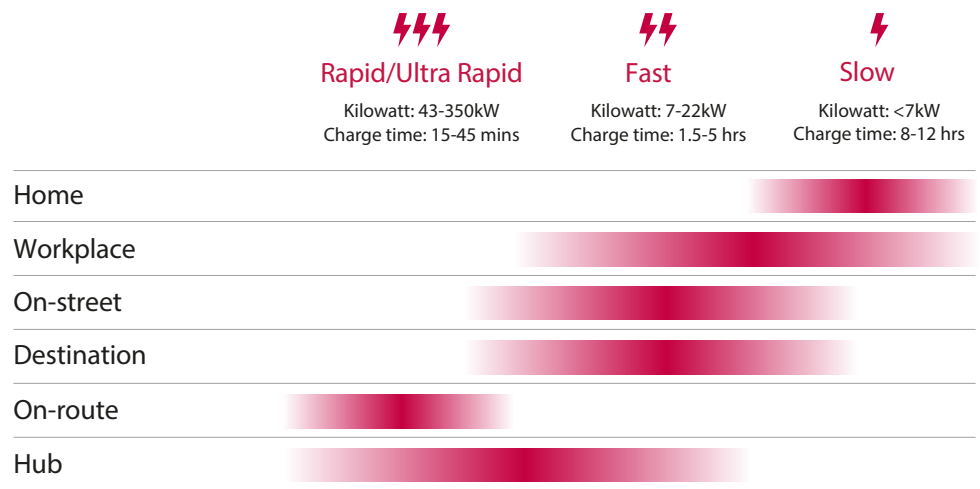
Home



Provided for users with off-street parking and is the cheapest and most convenient form of charging.

2.2 Speeds

The three main types of charge point are slow, fast and rapid/ultra-rapid. Choosing the right type of charge point to install depends on location type and the factors outlined in the project planning section. A mix of charge point types may also be appropriate where a location serves different user needs.



2.3 Range

Charging a vehicle for 20 minutes adds roughly the same amount of range to that vehicle as the power output of the charge point.

Charge point type	Power output	Range added in 20mins
Slow ⚡	7kW	7 miles
Fast ⚡⚡	22kW	22 miles
Rapid ⚡⚡⚡	50kW	50 miles

2.4 Plug connection types

The electricity network in Wales is an alternating current (AC) system, however the batteries in electric vehicles require direct current (DC) to recharge. There are two types of charging system:

AC	DC
Charge point delivers AC electricity to the vehicle which converts it on-board to DC.	Charge point itself converts AC to DC.

The connection plug type varies dependent on speed and current type of the charging system:

Speed	AC	DC
Fast Up to 22kW	Type 2 	N/A
Rapid/Ultra Rapid Up to 350kW	N/A	CCS  CHAdeMO 

CCS is the dominant standard for DC charging in the UK, however many early EVs utilised the CHAdeMO standard. For rapid charge points it is good practice to include connectors for both standards.

2.5 Planning requirements

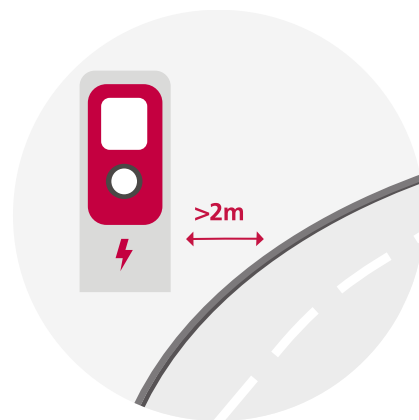
The Town and Country Planning (General Permitted Development) (Amendment) (Wales) Order 2019 allows charge points to be installed, altered or replaced in areas of off-street parking without planning permission.

The maximum upstand height in Wales is currently 1.6m. An amendment to planning requirements in England only has increased this to 2.3m in England.

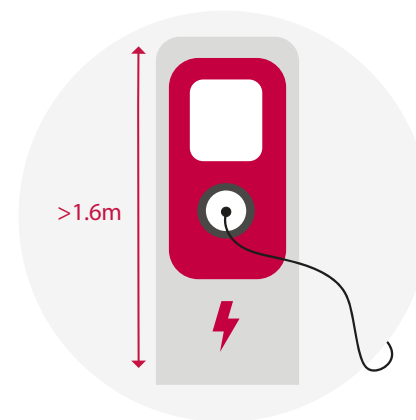
Planning Policy Wales Edition 11 states that charge points must not cause an obstruction to walking and cycling, should be resistant to vandalism, and located where there is good natural lighting and surveillance.

Active travel teams should be consulted at an early stage when planning the installation of charge points, and Active Travel Network Maps should be reviewed. This will help to avoid conflicts between works and make sure that charge points will not hinder the development or operation of active travel schemes.

To install a charge point without planning permission it must be:



More than 2m from the highway



Under 1.6m in height,
or 0.2 m³ if wall mounted



Away from the grounds of scheduled
monuments or listed buildings



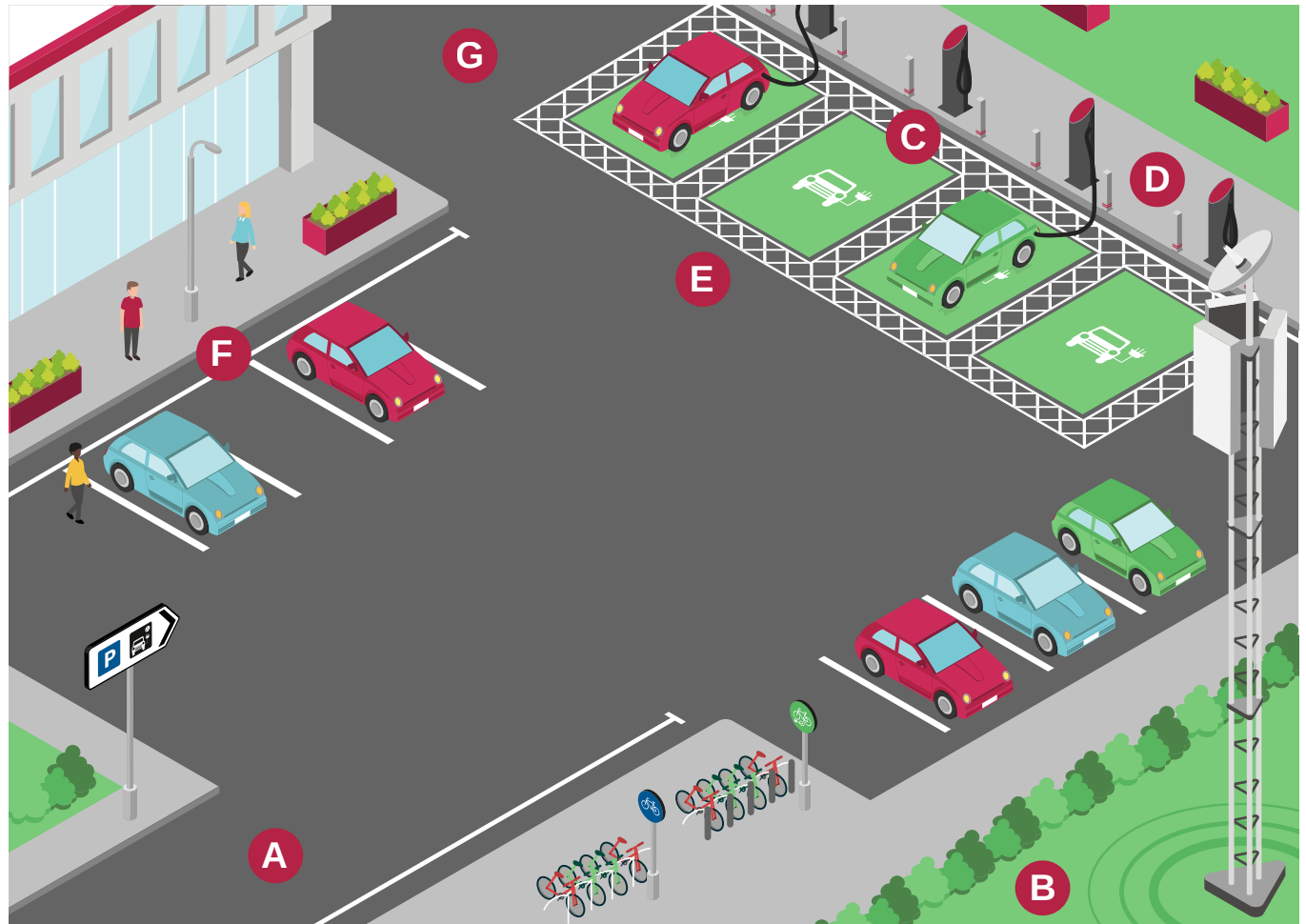
Only one charge point
per parking space (or spaces)



3. Placement

Best practice is that potential sites **should:**

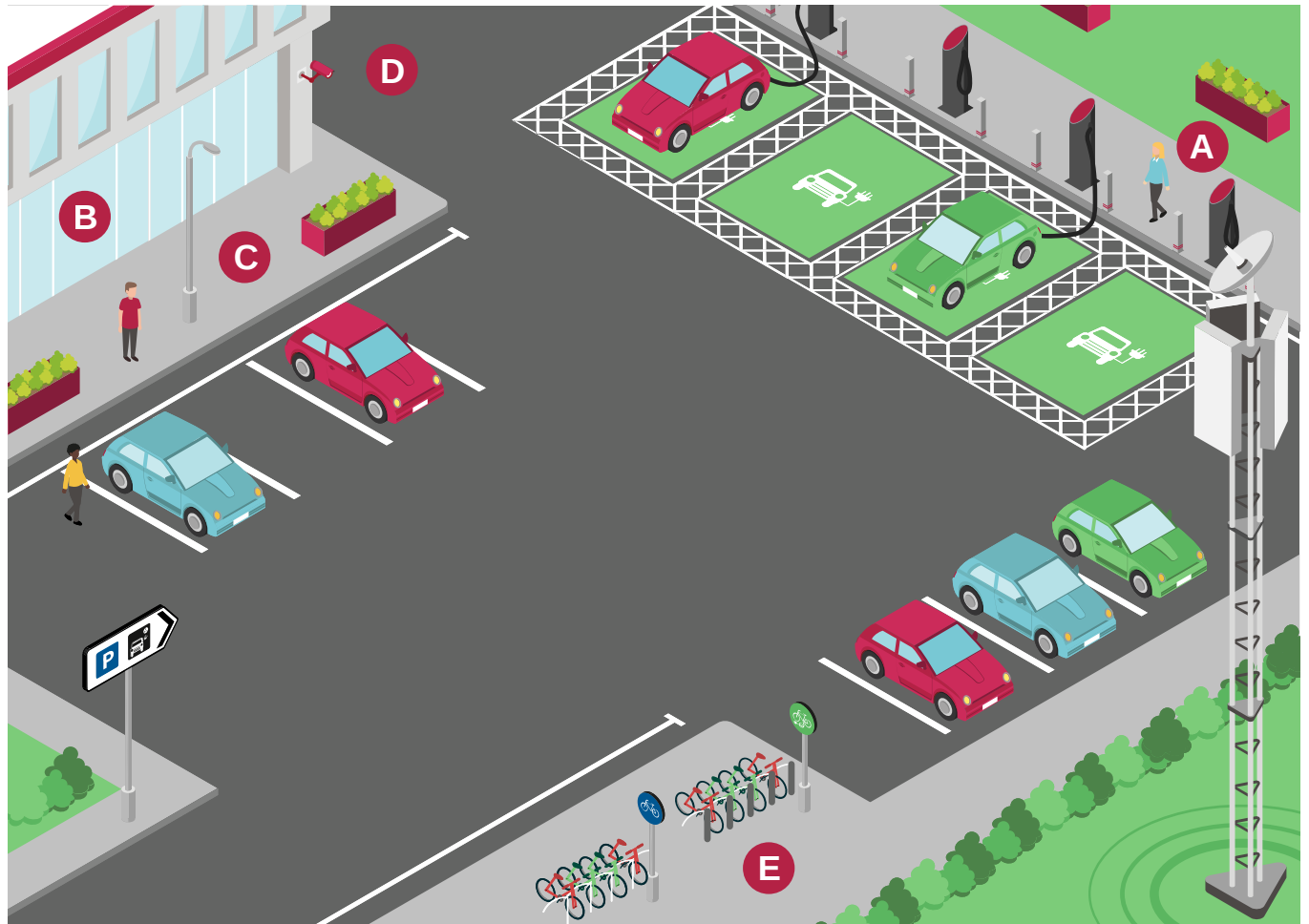
- A** be readily accessible from the public highway, with sufficient space for turning and parking
- B** have a good level of mobile telephone signal coverage at the site, as many charge points require a mobile signal to process payments
- C** have sufficient room for maintenance with no litter traps
- D** have a surrounding area that is level and enables easy access to the charge point
- E** be accessible to wheelchair users and users of mobility aids
- F** be sufficiently lit
- G** allow for future expansion of charging into adjacent parking bays if required



Placement of charging: Best practice features

It is **desirable** that potential sites:

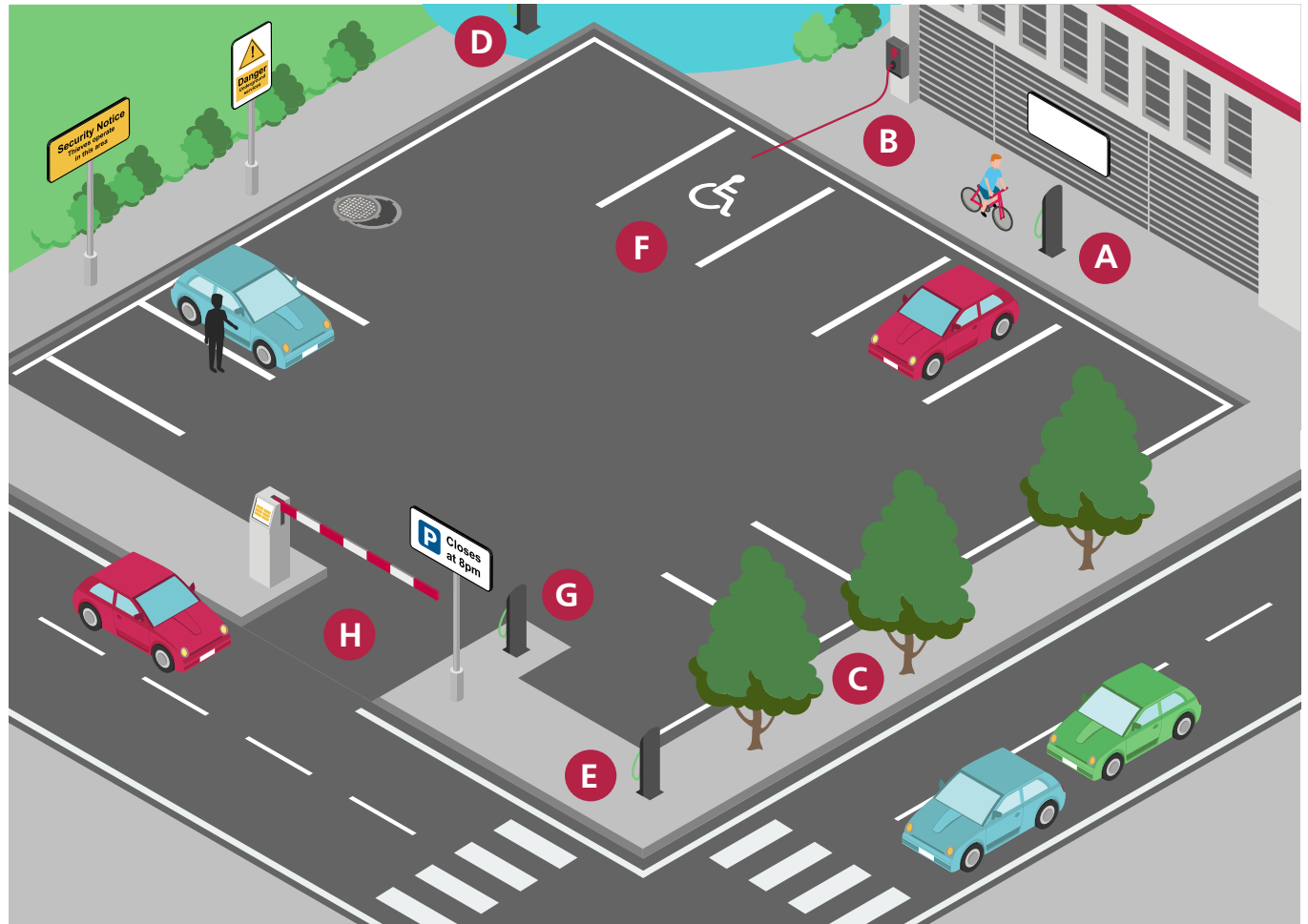
- A** feel like a safe environment for users with sightlines to amenities and/or others users.
- B** be in close proximity to shops, cafes, supermarkets, and toilets
- C** have lighting which is operational throughout the night
- D** have CCTV
- E** compliment and are compatible with other low emission mobility charging infrastructure



Placement of charging: Desirable features

Potential sites **should not**:

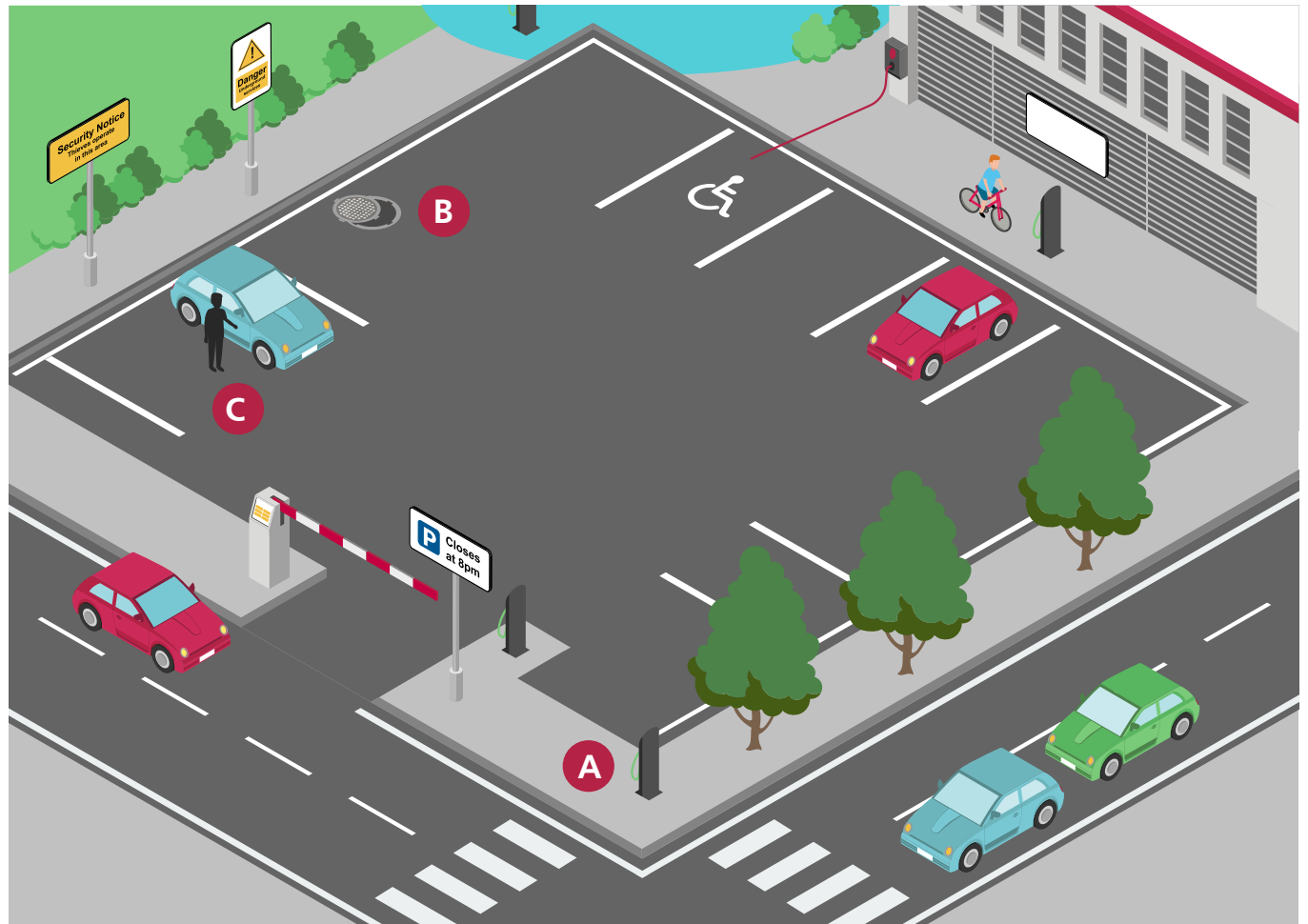
- A** result in an obstruction of footways or cycleways
- B** be at the back of a footway or be wall-mounted where a cable is required to be placed across a pedestrian area or cycle route
- C** be close enough to trees that there is a risk of tree roots damaging underground cabling
- D** be susceptible to flooding
- E** be close to junctions and crossing points where there is a risk of sightline obstruction between pedestrians and motorists
- F** replace bays that are already allocated for disabled provision
- G** be positioned where the charge point could be easily damaged
- H** have any barriers preventing 24/7 access to the charge point



Placement of charging: Poor practice

It is **not desirable** that potential sites:

- A** have a surface which is difficult to excavate and reinstate
- B** have underground services that will hinder installation works
- C** be positioned in locations where users feel unsafe



Placement of charging: Undesirable features

3.2 General placement

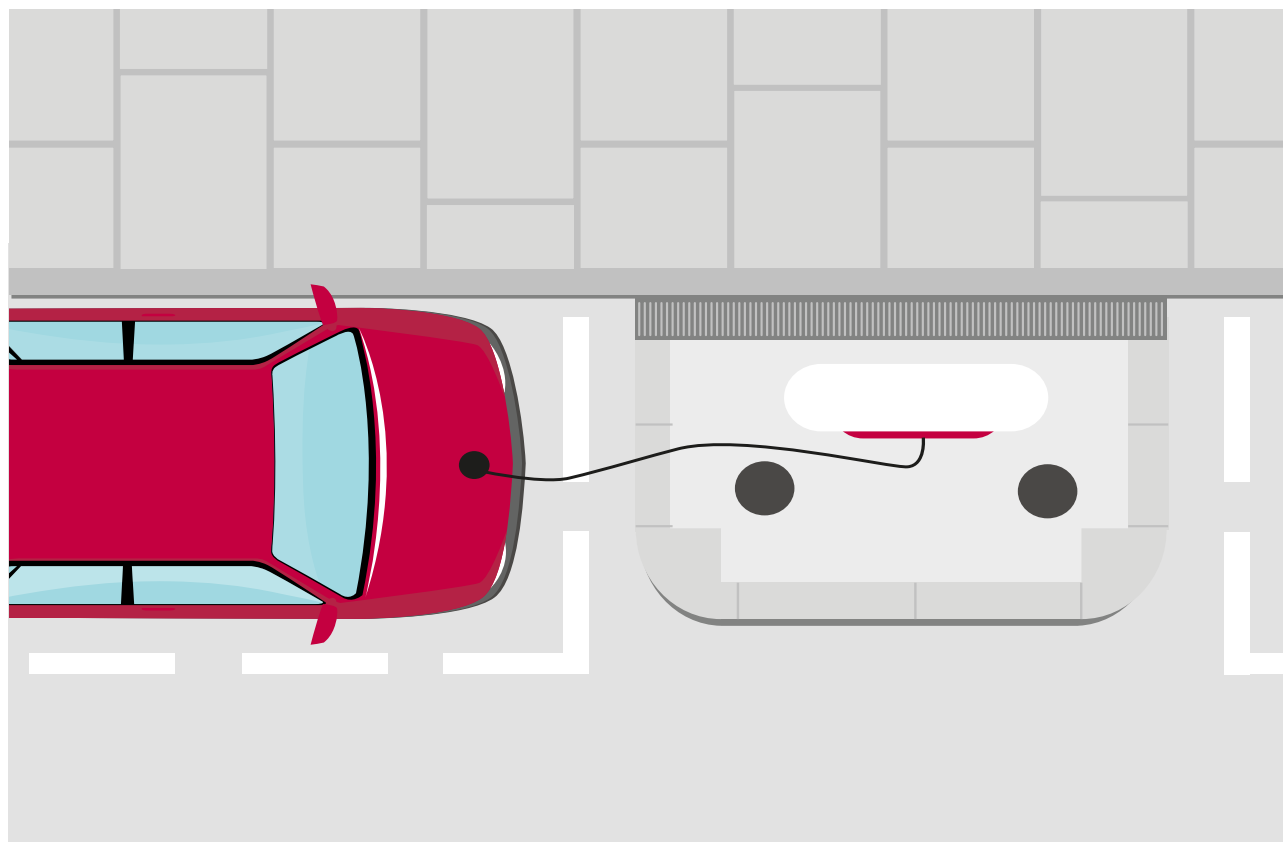
Date	August 2019
Author	Energy Saving Trust
Title	Positioning chargepoints and adapting parking policies for electric vehicles
Contents	Section 2 outlines the orientation that maximises access and future expansion around off-street charging.

3.3 On-street placement

Kerbside charge points should not be placed in a way that causes obstruction to wheelchair users, pushchairs or others with accessibility needs.

Where the installation of a charge point on the pavement would cause an obstruction the recommended solution is a kerb build out design.

Where space on both the pavement and road is constrained then a local hub is the recommended solution.



Example of a 'kerb build out' design



4. Streetscape

4.1 Accessibility

Public charge points should be accessible for all. The [Equality Act 2010](#) legally protects people with protected characteristics from discrimination and for public organisations in Wales this is implemented through the [Public Sector Equality Duty](#).

Public sector organisations should consider whether an Equality Impact Assessment should be undertaken. In the case of charge point provision this means looking closely at the inequalities between socio-economic groups (on-street vs home charging).

Emerging standards highlight the need to consider cable management systems to make it easier for customers to plug in their vehicles.

This document draws upon this emerging best practice.

Date	Author	Title	Description
2022	British Standards Institute (BSI) in partnership with Motability	Electric vehicles - Accessible charging - Specification (PAS 1899)	Recommendations for the provision of accessible public charge points for electric-powered vehicles to all potential users, including, for example, disabled people and older people.
2022	Office for Zero Emission Vehicles	Design considerations for electric vehicle chargepoints	Aimed at encouraging organisations that install electric vehicle charge points to consider the role design can play in ensuring an inclusive, accessible and easy-to-use charging network.
2021	Department for Transport	Inclusive Mobility A Guide to Best Practice on Access to Pedestrian and Transport Infrastructure	Provides the latest guidance on designing and improving the accessibility and inclusivity of public pedestrian infrastructure.
2018	British Standards Institute	Design of an accessible and inclusive built environment - External environment	Provides guidance on designing accessible and inclusive environments including accessible parking spaces, spacing around obstacles on access routes such as charging points, and accessible chargers.

4.2 Traffic signs

Charge points should be easily identified by users through clear and consistent signage. Whilst drivers can search apps for charge point locations, this is not always precise which makes signage very important.

All traffic signs in Wales that display text should be bilingual with the Welsh language displayed as to be seen first, in accordance with the [Welsh Language \(Wales\) Measure 2011](#).



Prescribed sign within Schedule 4 of the [Traffic Signs Regulations and General Directions 2016](#) and also described in guidance from the [Traffic Signs Manual](#).

Signage should also highlight any restrictions associated with parking in the bay, such as maximum duration of stay. Regular cleaning and maintenance of signage and information panels is recommended to ensure that they remain legible.

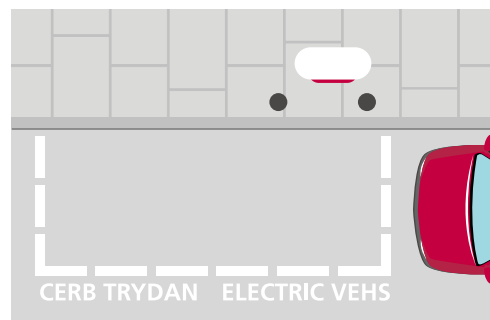
[Consumer Experience at Public Chargepoints](#) suggests a lack of signposting to public charge points along motorways, A-roads, at MSAs and destinations.



Sign used to indicate the location of a charge point.

4.3 Road markings

On-street



Road markings for on-street parking bays with charge points installed adjacent should comply with the [Traffic Signs Regulations and General Directions 2016](#). The dotted road marking may be provided with the text omitted.

Off-street



This guidance recommends that road markings for off-street parking bays with charge points in Wales should:

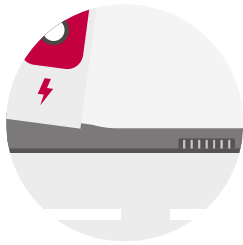
1. Have a bay (min 2.4m x 4.8m)
2. With a white EV icon (same as traffic sign)
3. And white hatching on all sides (min 1.2m)

All off-street bays should use hatching to make bays accessible for all customers.

The size of the EV bay should be considered if there is a need to accommodate larger vehicles.

4.4 Surface gradient

BSI standards state that the surface on which a charge point is placed for charge points located beside accessible parking bays should have a fall to ensure surface water drainage but not steeper than 1:40, and preferably not steeper than 1:60.



There should be dropped kerb access near to the chargepoint with a maximum of 8m away.

4.5 Lighting

User safety and the perception of safety can be aided by illuminating the charge point and surrounding area. Lighting around charging infrastructure should be suitable to ensure the safe operation of the charging equipment at all times throughout the night.

Lighting around charge points should also allow tripping hazards such as unreturned charging cables to be identified.



There may be limits on the amount of light you can emit in certain areas e.g. National Parks

4.6 Impact protection

Impact protection should be provided at sites where a charge point is:

- At increased risk of being damaged by vehicle impact e.g. at the end of a parking bay
- High-powered and/or high value e.g. rapid or ultra rapid



Impact protection can be either:

1. Bumpstops
2. Bollards



Ensure that protective systems do not make it difficult for users to access charge points, especially those with mobility issues or wheelchair users.

4.7 Security cameras

It is recommended that CCTV is provided at charge point sites. CCTV aids with user safety and the prevention of vandalism.



5. Energy and connections

5.1 Assessing incoming supply

Charge points require an electrical power source which is provided through a connection to:

- the national grid, either directly, or more commonly via a local distribution network, or
- a battery storage system powered by on-site renewable generation, or
- an alternative independent off-site energy supply.

If there are any concerns around the adequacy of a supply, possible solutions may include:

- Limiting the maximum current capacity of the charging equipment
- Implementing a load management strategy (this should not be to the detriment to the user experience)
- Upgrading the incoming supply

5.2 Distribution Network Operator

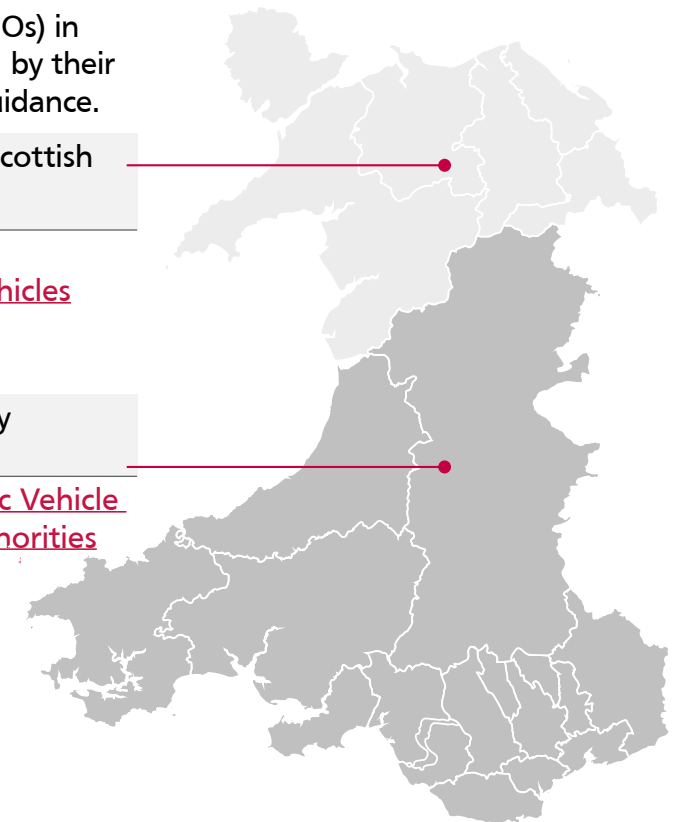
Connections via Distribution Network Operators (DNOs) in Wales can be supported by their advice and published guidance.

SP Energy Networks (Scottish Power)

[SP Energy Networks Connecting Electric Vehicles](#)

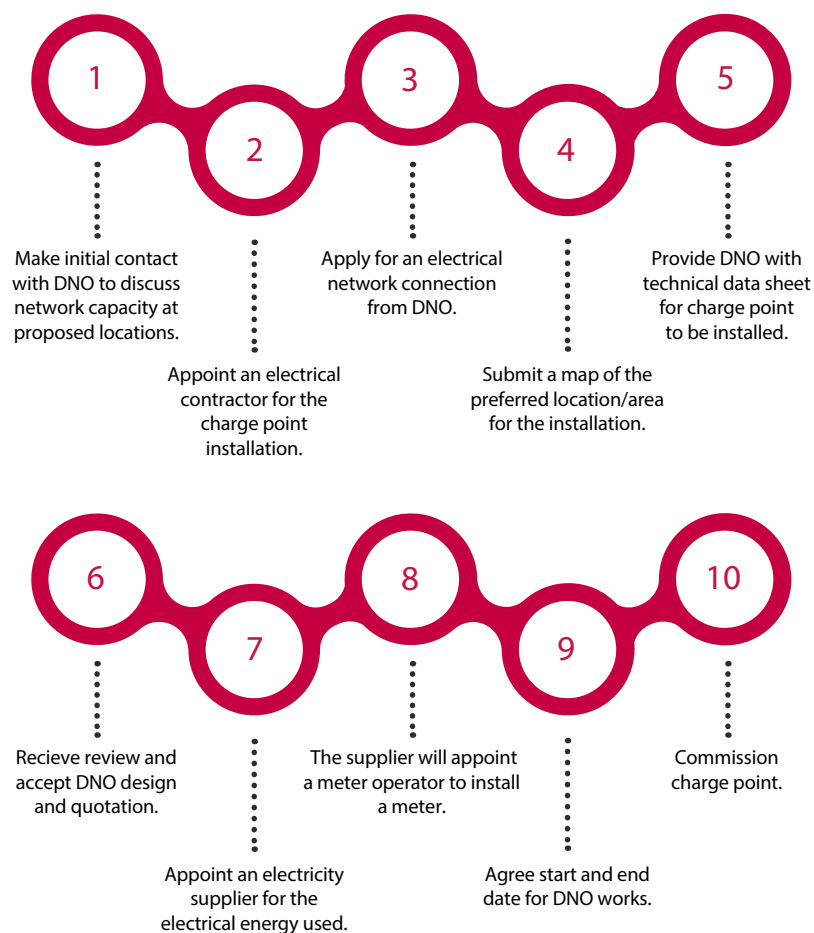
National Grid Electricity Distribution

[WPDS Guide on Electric Vehicle charging for Local Authorities](#)



5.3 Connecting to the Distribution Network

The typical process for connecting a charge point to the distribution network is outlined below:



The time and cost to set up a DNO connection varies based on number and type of charge points to be installed, indicative costs and timescales are shown below:

	Small 	Medium  	Large   
Number of charge points (up to)	6 fast or 1 rapid	37 fast or 5 rapid	135 fast or 20 rapid
Max kVA	70	300	1000
Approximate connection time	8 – 12 weeks	8 -12 weeks	4 months+
Approximate space required for feeder pillar	0.45m x 0.25m	0.6 m x 0.25m	1m x 0.39m
Approximate space required for sub station	-	-	3.3m x 2.4m
Approximate cost ¹	£1-3k	£3-10k	£70-120k

For new large DNO connections (above 300 kVA) a substation is likely to be required. Planning permission and space for a substation should therefore be factored into any potential site. An application for larger capacity connections directly to the transmission network can also be made to National Grid.

¹ Connection costs are variable and should be determined on a site specific basis. Costs can exceed those quoted here should wider network upgrades be required.

5.4 Managing connection costs

New electricity connection costs can impact on the financial viability of electric vehicle charging installations and therefore many public organisations may wish to utilise existing connections.



It is important to consider street works and grid connections early in the project to minimise costs and delays. Getting energy to a potential site has been known to create delays in delivery of charging infrastructure projects.

Date	August 2019
Author	Energy Saving Trust
Title	<u>Minimising the costs of street works and grid connections for electric vehicle charging infrastructure</u>
Contents	This guide covers the roles of local authorities in relation to street works, approaches to minimise the cost of street works and considerations to reduce the impact of electricity grid connection issues.

On-site renewable energy generation and storage may be an option to help reduce costs or constraints associated with a connection to the grid. On-site generation and storage (batteries) may be a solution.

5.5 Electrical requirements

Year	Author	Title	Description
2022	BSI	BS 7671 (Requirements for Electrical Installations) IET Wiring Regulations	Covers requirements that apply to the design, erection and verification of electrical installations. Also provides best practice for electrical installations safety. Section 722 of the standard specifically covers EV charging installations.
2019	BSI	BS EN 61851 (Electric Vehicle Conductive Charging Systems Series)	This series of standards provides general requirements for EV supply equipment used to charge EVs. Covers aspects related to • Characteristics and operating conditions of the EV supply equipment • Specifications for the connections between the EV supply equipment and the EV • Requirements for electrical safety of the EV supply equipment
2015	BSI	BS EN 62196-1:2014 (Plugs, Socket-Outlets, Vehicle Connectors and Vehicle Inlets)	This series of standards covers requirements for accessories associated with EV charging. This includes plugs, socket outlets, vehicle connectors and vehicle inlets. Covers requirements such as dimensional compatibility and interchangeability.

The [IET Code of Practice for Electric Vehicle Charging Equipment Installation](#) provides a practical interpretation of BS 7671 for installers.

5.6 Independent Connection Provider

In addition to DNOs other parties can help establish a grid connection.

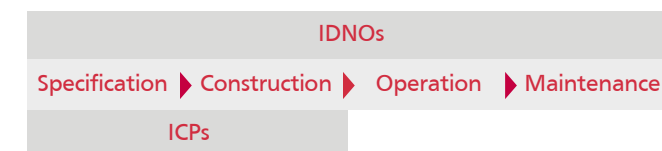
Independent Connections Providers (ICPs)

Are accredited companies that can build electricity networks to the specification and quality required for a network operator to adopt them.

Independent Distribution Network Operators (IDNO)

Will carry out the work, build and continue to own this local network and provide all ongoing network services, including maintenance and 24-hour fault repairs.

The stages at which each can be involved is outlined below.



5.7 Cable routing and wayleaves

When situating charge points, public organisations should consider whether it is necessary to route cables across private land, either to connect the charge points to the electricity grid or as part of a grid upgrade.

A wayleave agreement may be needed for laying across private land, which may take several months depending on the complexity of the agreement.

SP Energy Networks (Scottish Power)

Legal Permissions and Consents

National Grid Electricity Distribution

Land Rights and Consents



5.8 Electricity supply and tariffs

A single payment metric should be displayed clearly for users so that pricing information is prominent and clear, and that the tariff should be available to the user ahead of starting a charging session. It should be clear to the user whether any additional payments for parking or on-site services are required.

Parking tariffs where relevant should also be clearly displayed. Additional 'overstay' charges may be applied to encourage drivers to vacate a charging bay when charging is finished or after a set time period. Any such charges should be clearly advertised.

UK Government will be **mandating** all charge point operators to display their pricing in p/kWh metric later this year (2022).

The use of **Measuring Instrument Regulations 2016** (MIR) compliant meters will assure users of the amount of electricity they are paying for when they use a charge point. MIR meters enable fair and standardised measurement as they accurately and consistently measure the amount of electricity used.



6. Operation

6.1 Service level agreements and operational life

Public charge points across Wales should be working and in good condition.

A contract agreement with Charge Point Operators (CPOs) should incorporate Service Level Agreements (SLAs) with penalties for non-compliance. SLAs can include:



Reliability - agreed minimum uptime per annum for a charge point



Customer service – standards of live customer support including timescales of resolution of issues



Maintenance - agreed response times for resolution of charge point issues

To instil user confidence a **99% uptime** in line with DfT recommendations is advised.

Charge points should also be provided with suitable warranties and a minimum operational life guarantee (the best practice minimum is 8 years).



6.2 Business models and operational arrangements

Where a public sector organisation is involved with the installation of electric vehicle charge points its preferred business model will inform the procurement method to be used. The simplest form of agreement where public sector land is being used is known as a 'concession agreement'. Alternatives include an 'own and operate' business model. There are other business models available on a sliding scale of the level of control and responsibility for operations that a public organisation retains.

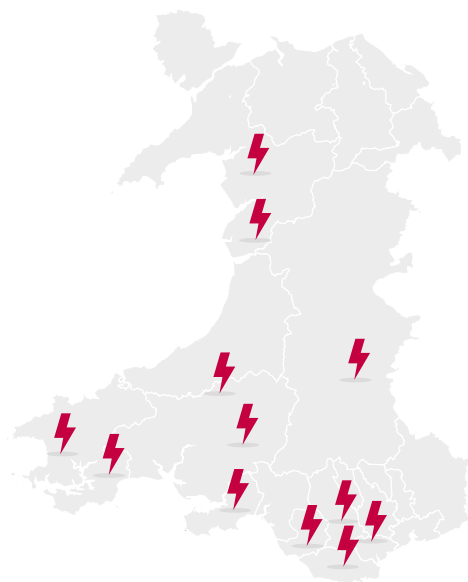
Charge Point Operators would prefer public organisations use a concession procurement route as it allows for a private market to develop naturally.

Consideration	Concession agreement	Own and operate
Introduction	A single supplier appointed to operate the EV charging scheme at no cost to the public organisation for the duration of the contract. The Concession Contracts Regulations 2016 defines a concession.	A public organisation appoints a supplier to install and manage charge points on public-owned land for the contract period and fully funds the installations, typically using grant funding and local authority capital.
Funded by	Grant funding and capital	Grant funding and capital
Regulation	Concession Contracts Regulations 2016	The Public Contracts Regulations 2015
Connection ownership	Usually public organisations (alternatives may be available)	Public organisation
Charge point ownership	Charge Point Operator (CPO)	Public organisation
Operation and maintenance	Charge Point Operator (CPO)	Public organisation (may be contracted out to a third party)
Locations	CPOs are likely to bid for the most commercially viable sites. Sites may be grouped or bundled during procurement to increase viability.	Public organisation can determine locations, irrespective of commercial viability
Benefits	Reduces operational cost and risk to the public sector. Allows the supplier market to develop. Can support value creation and cost reduction as CPOs operate at increasing scale.	Creates the potential for revenue to the public sector.
Other issues	Less direct operational control within the public sector. Service standards require monitoring through SLAs. Welsh Government is introducing a national procurement framework for the provision of EV Charging infrastructure which will improve access to suppliers and help retain local benefit for Wales.	Requires ongoing resource and expertise to own and operate charging facilities. Carries greater investment risk for the public sector.

6.3 Health and safety file

Organisations should be fully aware of their obligations under the [CDM Regulations](#) for the collation and handover of health and safety information to carry out the work safely.

6.4 Asset inventory and open data



Charge points, once installed, must be added to the [National Chargepoint Registry \(NCR\)](#) which is an open resource listing publicly accessible charge points in the UK. Public organisations should ensure that the data held on the NCR is correct on a regular basis.



The Open Charge Point Interface protocol (OCPI) is an international standard that enables charge point operators to standardise their data collection and storage.

To ensure that open data is easier to use and accessible for third parties to develop maps for users to locate charge points, all Welsh public charge points should adopt the OCPI standard.

6.5 Inspection and maintenance

Maintaining charge points to a high standard will promote a positive user experience across the Welsh public charging network. This can be achieved by:

1. Undertaking an annual on-site inspection of charge points, to include:



A visual check for sticker and signage issues



Inspection of lighting



Cleaning or replacing ventilation filters



Fixing road marking issues related to vehicle wear



Ensuring the ground remains level around the charge point



Inspection of the charge point, feeder pillar, distribution boards/equipment, enclosure heaters, wiring, metering, weather seals, circuit protection devices and earth continuity

2. Promptly rectifying issues impacting the operational availability of charge points.

6.6 Customer support

Instructions on how to use the charge point, such as initiating and paying for charging should be clearly displayed on the charge point.

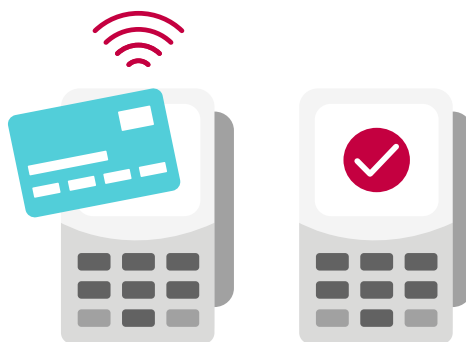


A free customer support helpline should be available 24 hours a day in the languages of Welsh and English. Customer support contact details must be clearly displayed on the charge point.

Helplines can support a positive customer experience by supporting those who have an issue using the charging network to continue their journey.

6.7 Payments services and fees

New charge points (7.1 kW+) should be fitted with a payment method that does not require a smartphone, such as contactless.



In 2023 the UK Government will be **legislating**: “A payment method that is not specific to a brand and does not require a payee’s mobile or internet signal.”

Payment systems must be provided in Welsh and English.

6.8 Data protection and cyber security

Up-to-date data and information on the locations and types of accessible charge points should be provided and shared in an open

access format with charge point operators and third parties. This will enable them to provide information to disabled motorists on the level of accessibility of charge points.

As vehicles and systems become increasingly connected, keeping data secure has never been more critical. It is essential to assess cybersecurity provisions and requirements, and develop an action plan to improve data security and cybersecurity if necessary.



The charge point must have appropriate security measures to ensure that its functions are resilient to cyber-attack. The charge point must also ensure that any communications are exchanged securely with an appropriate level of encryption to prevent interception by an unauthorised third party.

The collection of any personal information (e.g. billing details) by the charge point operator must be in accordance with the **Data Protection Act 2018**.

6.9 Traffic Regulation Orders

Traffic Regulation Orders (TRO) should be used to restrict access for non-electric vehicles to charging bays and to limit the length of stay for an electric vehicle.



Some Welsh public organisations have experienced non-EVs parking in charging bays with TROs. This has blocked charge points for genuine use and led to frustration and a poor user experience.

Civil Enforcement Officers (CEOs) should undertake regular checks of EV bays to issue Penalty Charge Notices (PCNs) to vehicles violating a TRO. Proximity sensors mounted into the charging bay surface can be used to alert CEOs to the presence of a vehicle.

6.10 Managing overstay

Parking conditions can include penalties for exceeding a specified duration of stay, enforced via PCNs (the parking conditions must be clearly advertised). There may also be an overstay penalty specified in the tariff for charging (also clearly advertised) which is payable alongside payment for charging services.

Both mechanisms encourage users to move their vehicles after charging to make the space available to other users. When installing charge points it is important to consider the overall user experience and that penalties are reasonable and proportionate, based on circumstances.

6.11 Digital standards, data and interoperability

Charge points should be maintained so that they are compatible with the [Open Charge Point Protocol \(OCPP\)](#) or subsequent updated versions of OCPP.



Charge points which are OCPP compliant allow operators the flexibility to switch between backend software providers throughout the operational lifetime of the charge point.



7. Additional guidance

7.1 Procurement frameworks

Date	Owner	Title and link	Description
2023	Welsh Government	National Procurement Framework	A developing framework that will help standardise the procurement delivery model for Welsh public organisations.
October 2021	ESPO	Vehicle Charging Infrastructure 2 (VCI 2)	Provides access to a range of vehicle charging infrastructure solutions including fast/rapid and ultra-rapid electric vehicle chargers for the public sector. This is a non-concession scheme.
May 2020	Crown Commercial Service	Vehicle Charging Infrastructure Solutions (VCIS)	Public sector access to products and services that support vehicle charging infrastructure, such as charge points. Local authorities can purchase a full end-to-end solution or specific elements to support the transition to low emission vehicles.
Jan 2020	EEM	Electric Vehicle Charging Infrastructure Framework	Support with legal compliance to meet current legislation and guidance for the supply, installation and maintenance of electric vehicle charging points (EVCPs) and back office support.

7.2 Funding opportunities

Grant funding options for public organisations are provided below:

Date	Owner	Title and link	Description
June 2022	Welsh Government	Local Transport Fund	Funding for local authorities to deliver accessible and sustainable transport systems.
March 2022	Office for Zero Emission Vehicles	Local Electric Vehicle Infrastructure (LEVI) Funding	Funding for local authorities to provide on-street slow and fast charge points.
April 2021	Office for Zero Emission Vehicles	On-Street Residential Chargepoint Scheme	The scheme gives local authorities access to grant funding that can be used to part-fund the procurement and installation of on-street EV charge point infrastructure for residential needs.

7.3 Procurement guidance

Additional guidance for the procurement process is provided below:

Date	Author	Title and link	Description
September 2019	Energy Saving Trust	Procuring electric vehicle charging infrastructure as a local authority	This guide describes the increasing range of options open to local authorities to fund and manage public charge points, illustrated by extensive case studies. It concludes with procurement 'top tips'.
N/A	Welsh Government Energy Service (WGES)	Energy Service (for public sector and community groups)	The Energy Service offers technical, commercial and procurement advice and support to help turn energy projects into reality.

7.4 Futureproofing infrastructure

Charging assets can retain their value for longer by planning for future charging needs. To achieve this, charge points need to be:



Interoperable with different types of electric vehicles and their associated systems



Intentionally placed, installed and operated in a location that will allow it to be used for its entire lifetime



Adaptable to cope with changes in technology, its use and operation

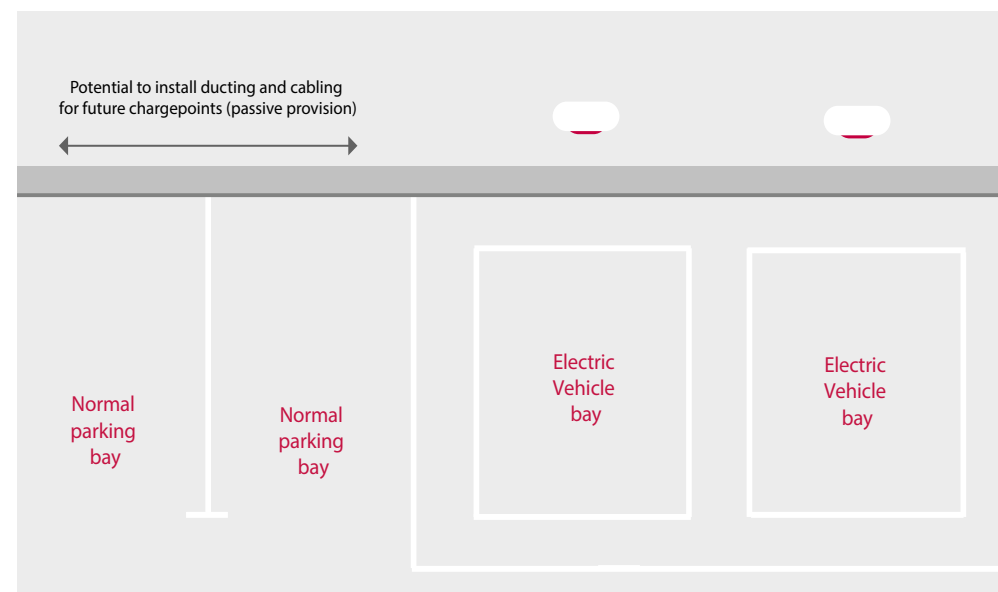


Capable of communicating securely with third parties as required

Date	March 2020
Author	BEAMA
Title	Best Practice for Future Proofing Electric Vehicle Infrastructure
Contents	Guidance on best practice and guiding principles to future proof charging infrastructure, covering as topics such as interoperability, roaming, charge point placement, grid capacity, and adaptability.

Welsh Government is committed to deploying innovative solutions that will help the roll-out and future-proofing of a charging infrastructure that will meet the needs to all users across Wales. This includes lamppost charging solutions for Wales. Best guidance will be provided in the next iteration of the National Standards.

7.4.1 Passive provision



Passive provision is where additional ducting, cabling and potentially power supply are added at charging bays adjacent to 'active' charge points so that additional charge points can be easily added at a future date. In some locations, a small number of chargers may be installed initially but any plans for future expansion should be integrated from the outset. This is more cost efficient over time.

Rapidly increasing demand for charge points indicates that best practice allows for easy and coherent future expansion that maintains a positive user experience.

7.4.2 Data sharing and management

Monitoring charge point usage through metrics such as average charge events per day and average charge duration (minutes) helps to inform future infrastructure investment decisions by identifying patterns and trends. This also enables the commercial, carbon reduction and social benefits to be monitored and evaluated.

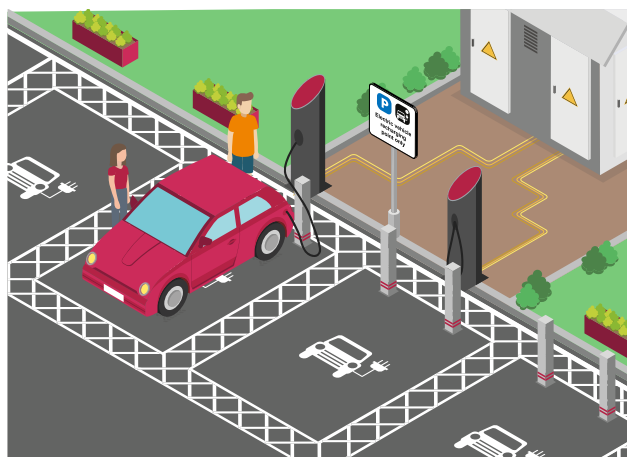
7.4.3 Smart charging and infrastructure

Smart charging enables the charging of an electric vehicle to be paused or slowed according to electricity network demands. Best practice dictates that smart charging does not undermine the quality of the user experience. When charge points fall out of service (or charge slowly) when charging is in demand, it reduces availability and reliability, delaying onward journeys.

The Electric Vehicles (Smart Charge Points) Regulations 2021 was introduced to ensure all UK charge points have smart functionality as standard.

7.4.4 Future grid requirements

The provision of electricity and adequate grid reinforcement is an enabler for the longevity of charging assets. Installing a larger substation or electricity connection can assist in supporting these requirements, should expansion take place.



7.4.5 Vehicle to grid (V2G)

Vehicle to grid (V2G) technology refers to the use of vehicle batteries as storage to help balance supply and demand on the electricity network. This applies at different scales from individual batteries up to the aggregation of multiple batteries across one or multiple carparks. Currently many EVs and charge points are not compatible

with V2G. V2G is expected in future to be key to facilitating the transition to a decarbonised energy system in Wales.

More information and guidance on V2G and inductive charging can be found in the [IET code of practice](#). The international standard [ISO 15118 Road vehicles - Vehicle to grid communication interface](#) contains further guidance on V2G communication and details of the plug and charge feature.

7.4.6 Micromobility

As adoption of micromobility increases, public organisations should consider how charging hubs can potentially include charging infrastructure for e-bikes and e-scooters.

7.4.7 Emerging solutions

New and alternative solutions for EV charging being developed include battery exchange, wireless charging and mobile charging to reduce barriers to accessing charge points. Monitoring the roll out of new technology and planning for future potential can improve the user experience, widen accessibility and enhance the benefits.

Annex A: Key messages

No.	Section	Key messages
Introduction		
1.1	National charging strategies and policy	✓ Understand the strategies and policies that support public organisations installing public charging infrastructure
1.2	Future policy, guidance and standards	✓ Be aware of and monitor emerging policy, guidance and standards
1.3	Project planning	✓ Ensure local needs and demand are understood prior to procurement. Plan for charging demand both now, and in the future as EV adoption increases
1.4	Roles and, responsibilities and collaboration	✓ Understand the range of stakeholders involved in planning, procuring, and installing public charge points ✓ Consider the most appropriate business model and operational model for the project circumstances, including working with delivery partners and how the capital expenditure and risk is distributed. ✓ Understand the importance of collaboration for smooth delivery of charge point
Charge point		
2.1	Locations	✓ Understand the use cases for providing public charge points ✓ Understand that locations with multiple charge points have the highest average usage
2.2	Speeds	✓ Understand the different charge point speeds and how they relate to different charge point locations
2.3	Range	✓ Understand the vehicle range that different charge point speeds provide

No.	Section	Key messages
Chargepoint		
2.4	Connection types	✓ Understand the differences between charge point connection types ✓ For rapid charge points two connector types are recommended. It is good practice to include connectors for both.
2.5	Planning permission	✓ Avoid the need for off-street planning permission by understanding the permitted development conditions
Placement		
3.1	On-site assessment	✓ Understand the key factors that should be assessed at an identified potential site
3.2	General placement	✓ Consider the factors that can affect charge point positioning e.g. passive infrastructure
3.3	On street placement	✓ Understand that on-street provision may require a 'kerb build out' to avoid pavement obstructions
Streetscape		
4.1	Accessibility	✓ Understand the key factors that lead to the best placement of charge points ✓ Understand the responsibility of Welsh public organisations under the Public Sector Equality Duty
4.2	Traffic signs	✓ All traffic signs that display text must be bilingual with the Welsh language first ✓ Understand the recommended signage for off-street charge points
4.3	Road markings	✓ Understand the road markings that must be provided for on-street parking ✓ Understand the recommended bay design for off-street parking
4.4	Surface gradient	✓ Charge points should be installed on level ground with a slight gradient for water drainage
4.5	Lighting	✓ Ensure lighting around charge points assists in the safe operation of charging equipment
4.6	Impact protection	✓ Understand when to install impact protection and the different types
4.7	Security	✓ Consider installing security cameras after understanding the benefits

No.	Section	Key messages
Energy and connection		
5.1	Assessing incoming supply	✓ Assess incoming supply for current and potential future demand
5.2	Distribution Network Operator	✓ Read the DNO specific guidance provided by DNOs
5.3	Connecting to the Distribution Network	✓ Understand a typical DNO connection process (including time and cost)
5.4	Minimising connection costs	✓ Understand the methods for minimising grid connection costs
5.5	Electrical requirements	✓ Be aware of the key electrical standards that apply to charge point installations
5.6	Independent Connection Provider	✓ Understand the role that other parties can play to establish a grid connection
5.7	Cable routing and wayleaves	✓ Consider avoiding routing cables across private land ✓ Read the land rights and consents advice provided by DNOs
5.8	Electricity supply and tariffs	✓ Understand the requirements around tariffs
Operation		
6.1	Service level agreements	✓ Specify a minimum charge point uptime per annum of 99% ✓ Agree a minimum operational life for any charge point installed
6.2	Operational models	✓ Select a procurement method based on preferred business model
6.3	Health and safety file	✓ Be fully aware of the H&S obligations under the CDM Regulations

No.	Section	Key messages
Operation		
6.4	Asset inventory and open data	✓ Check that charge points are added to the National Chargepoint Registry (NCR) ✓ Ensure public charge points adopt the OCPI standard
6.5	Inspection and maintenance	✓ Enable a positive user experience across the Welsh public charging network by maintaining charge points to a high standard ✓ Undertake annual on-site inspection of charge points
6.6	Customer support	✓ A free bilingual Welsh/English customer support must be available 24/7
6.7	Payment services and fees	✓ Payments must not require a membership or subscription
6.8	Data protection and cyber security	✓ Act in accordance with the Data Protection Act 2018
6.9	Traffic Regulation Orders	✓ Implement Traffic Regulation Orders (TROs) where necessary
6.10	Managing overstay	✓ Implement mechanisms for managing overstay to increase charge point availability
6.11	Digital standards, data and interoperability	✓ Ensure compatibility with the Open Charge Point Protocol (OCPP)
Additional information		
7.1	Procurement frameworks	✓ Understand the latest procurement frameworks to help procure charge points
7.2	Funding opportunities	✓ Understand the latest grant funding to help procure charge points
7.3	Procurement guidance	✓ Find additional guidance for procurement
7.4	Futureproofing infrastructure	✓ Consider options for futureproofing charging assets ✓ Understand emerging technologies related to charging

