

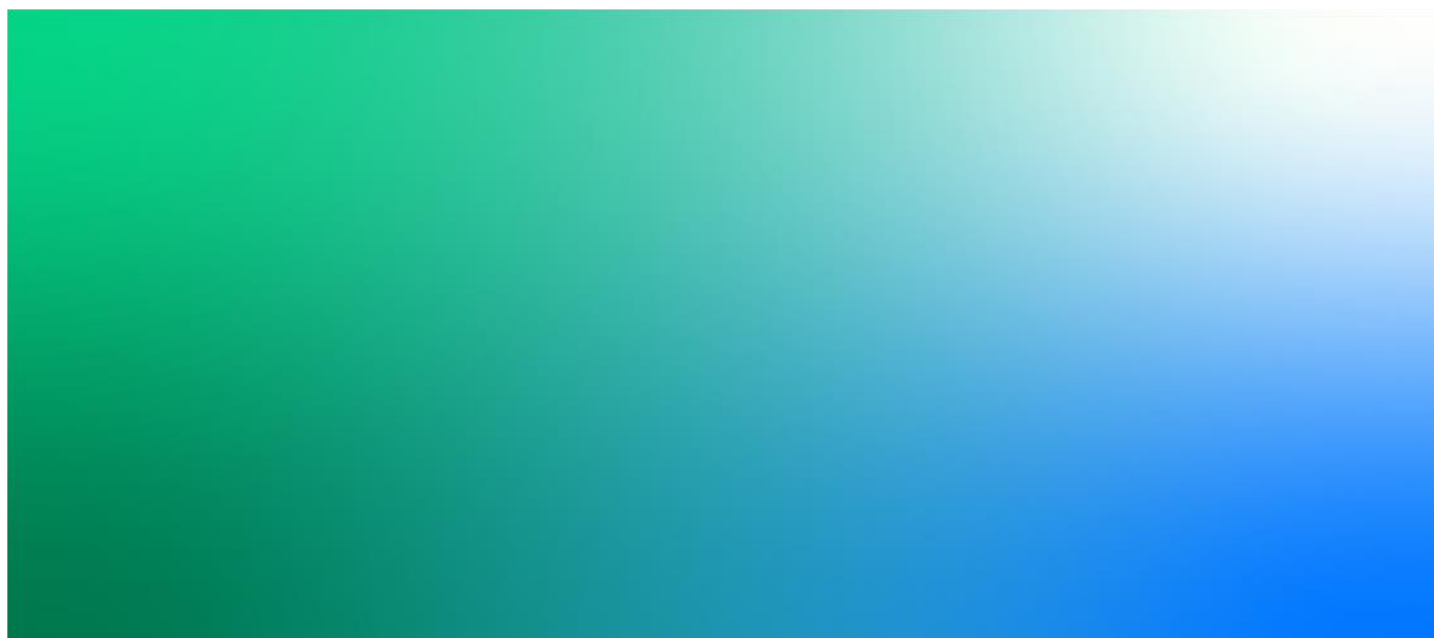


On-street electric vehicle charging strategy

Draft Strategy

May 2020

Bath & North East Somerset



On-street electric vehicle charging strategy

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V2	May 2020	Final draft strategy following B&NES comments	LC/EA/CA/RL	EA	RL	

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1. Introduction and Vision

1.1 Context

The declaration of a Climate Emergency within Bath & North East Somerset (B&NES) in March 2019 outlined the resolution for the authority to be carbon neutral by 2030. This requires a transformational change in how people choose to travel and how goods are transported across the authority. The necessary revolution in the transport system requires the development of solutions at a local level which go beyond the schemes and policies set out in the newly adopted Joint Local Transport Plan 4 (JLTP4) and Getting around Bath Transport Strategy.

B&NES Council recognise the importance of responding to the Climate Emergency, which demands a fundamental step-change in methods of travel by local residents, visitors and workers. It requires a major shift to public transport, walking and cycling in order to reduce transport emissions, particularly for shorter trips. Overall the Council, along with the other West of England authorities, recognise the need for vehicle use to fall substantially and for the vehicles that remain to produce zero carbon emissions. A wide range of initiatives will play a part in delivering this.

However, going forward and particularly in the short term, there inevitably remains a role for the private car for some trips and for some users. In this situation the Council's aim, in line with national policy and industry changes, is to encourage the use of zero- or low-emission vehicles. Electric vehicles have potential to offer significant benefits and are an important part of the overall toolkit for improving air quality in B&NES and addressing the Climate Emergency.

It should be noted that this strategy was developed before the Covid-19 pandemic and its emerging effects. In particular, the changes in air quality and congestion identified in the immediate weeks after lockdown were unparalleled. Whilst the radical changes in travel behaviour, resulting from lockdown and social distancing, are not likely to be fully maintained in the longer-term, there will undoubtedly be a shift in how people choose to travel to work, along with changes in home-working and home-shopping behaviours. Electric vehicles play a vital role in improving air quality in B&NES, along with wider transport schemes, such as low traffic neighbourhoods.

There is a clear need for appropriate infrastructure to be provided across B&NES to support electric vehicle charging. Various high-level policies and approaches are being developed to address this, including an Ultra-Low Emission Vehicle Policy Statement which is currently being prepared jointly by the West of England Combined Authority and its constituent authorities (where B&NES are actively involved). It will be important that B&NES maintain a watching brief on these developments and update their own policy and approaches to ensure alignment.

In this context, this strategy document sets out the Council's current position and strategy on public on-street electric vehicle (EV) charging, recognising that this is a key area of demand and an area where there are likely to be short-term opportunities to deliver improvements. Delivery of on-street EV charging in B&NES is closely aligned with a number of other key policy initiatives being pursued by the Council to tackle the Climate Emergency. In particular, the implementation of low traffic neighbourhoods offer an opportunity for fresh thinking on how road space in residential neighbourhoods is used and is likely to bring new opportunities to deliver on-street EV charging.

This document focuses predominantly on the issues around provision of on-street EV parking in residential areas, recognising that making provision for charging in these areas where the proportion of homes with off-street parking provision is low (as is typical across Bath and other parts of the B&NES area) is a particular challenge.

1.2 The move to electric vehicles

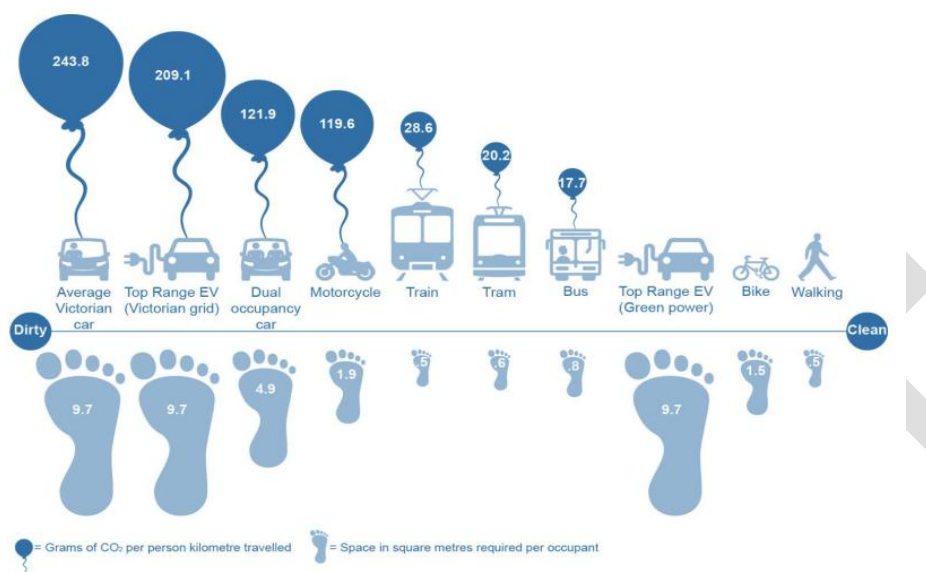
Electric vehicles produce less carbon emissions per kilometre than petrol/diesel vehicles, with less than 75g of carbon dioxide (CO₂) from the tailpipe for every kilometre travelled¹. Electric vehicles also do not produce any NO_x. However, they do contribute to Particulate Matter (PM) emissions through brake and tyre wear.

Figure 1.1 produced by the Institute for Sensible Transport², highlights how modern EV vehicles, along with cycling and walking, have the lowest CO₂ emission per kilometre compared with other modes of transport. As such, a shift to modern EV cars as well as walking and cycling is beneficial for reducing local carbon emissions.

¹ https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/830795/vehicle-licensing-statistics-april-to-june-2019.pdf

² <https://sensibletransport.org.au/>

Figure 1.1. Carbon footprint and space required (source: Institute for Sensible Transport)



Currently fewer than 1% of vehicles travelling through Bath city centre are electric. A step change is required to support the Climate Emergency and to achieve the Council's target of becoming carbon neutral by 2030. A range of factors are expected to drive increased electric vehicle uptake in coming years, including:

- Increasing awareness of the Climate Emergency, declared in B&NES in 2019. The increased attention of the Climate Emergency at a national level is also likely to increase awareness of the environmental impacts of road travel and influence consumer choices. The B&NES Climate Emergency Progress Report sets out specific aspirations for increasing electric vehicle use so that the percentage of vehicle kms by vehicle type shifts to 76% pure battery EV, 14% petrol-hybrid EV and 10% petrol/diesel by 2030.
- Regulatory changes including the recent decision by UK Government to ban the production of new petrol, diesel and hybrid vehicles (which do not require plug-in charging) in the UK from 2035.
- Advancing technology is continually increasing the range, performance and accessibility of electric vehicles. This includes advances in charging technologies. Almost all major car manufacturers now make at least one electric car and the latest technology can now offer a vehicle range of over 200 miles, making electric vehicles a more attractive proposition to vehicle owners.
- Introduction of Clean Air Zones (CAZ), Ultra-Low (ULEZ) and Low Emission Zones (LEZ) which will charge non-compliant vehicles. Whilst the implementation of a Class C CAZ in Bath will not charge drivers of private cars, the introduction of Bath's CAZ (which will charge vans and HGVs) and ongoing development of similar initiatives in other towns and cities, is expected to increase awareness and encourage a shift to electric vehicles.
- Increasing provision of public charge points across the region. For example, in the West of England the 'revive' project is delivering four rapid charging hubs and 120 new charge point connections through the Go Ultra Low West project.

Increasing the availability of on-street EV charging infrastructure within B&NES is required to support an increase in uptake of electric vehicles and reduce the number of polluting vehicles in the fleet mix.

1.3 The electric vehicle charging challenge

It can take several hours to refuel an electric vehicle, so charging takes place when the vehicle is parked. The advancement of charge point and battery technologies may significantly reduce these charging times in the future or reduce the need for charge points at all. Until that time, there is a need to increase provision of charge points to ensure electric vehicles are a viable transport alternative for residents to use now.

To ensure that people have appropriate access to electric vehicle charging networks, it is likely that provision will be required across a range of settings, to include:

- public car parks and Park & Ride sites;
- at workplaces;
- private provision, for example at peoples' homes (off-street, i.e. on driveways or in garages); and
- public provision within a reasonable distance of residential areas (offering the best opportunity for overnight charging in many cases).

Provision of charging points in car parks and at workplaces is increasing. Several locations exist within B&NES (see section 3 for further detail) and are proving successful.

Nationally, provision of private charging points in residential areas is becoming more common as a result of government grants available to householders to subsidise the installation of charging for private use in garages or on driveways. However, many residents across B&NES do not have access to suitable off-street space that can be used in this way. Therefore, in order to provide appropriate access to electric vehicle charging infrastructure there is a need to provide public on-street charging facilities.

TfL research³ shows that proximity to charging points is a key concern for public electric vehicle charge point users. Between 73-93% of users are likely to use a public charge point if it is within a five to ten-minute walk from their destination. This suggests that residents are much more likely to think about using EVs if there are charging points close to where they live and emphasises the importance of on-street provision within residential areas.

In increasing the provision for EV charging there are also additional over-arching potential issues and constraints which relate to the demand for electricity and the pressure that this places on the local electricity network. Ensuring that sufficient power can be provided is a key issue.

Provision of publicly available on-street electric vehicle charging facilities is subject to number of other challenges, including:

- availability of appropriate technology;
- method and availability of connection to electricity supply;
- management of system (payments, regulation of parking bays etc.); and
- consideration of visual and related impacts.

Currently there are no on-street EV charging facilities within B&NES. This document sets out these issues and looks at how B&NES can tackle them moving forward.

³ <http://content.tfl.gov.uk/understanding--electric-vehicles-research-findings.pdf>

1.4 The vision

In developing a position statement and strategy for on-street EV charging, it is important to consider the policy context, along with the overarching B&NES vision for the future. The draft vision below looks to reflect the wider aims of local planning and transport policy as well as the key priorities for B&NES in addressing the Climate Emergency.

In tandem within other policy approaches which aim to reduce the use of vehicles and promote active modes and public transport, B&NES will encourage and facilitate a switch to low-emission vehicles as part of the overall package of measures to help reduce transport-related emissions.

As a key part of this B&NES, recognising that for many residents' access to on-street electric vehicle charging is critical, will work towards the provision of a network of public on-street charging points across the authority by 2030, assuming technology and demand matches this need.

1.5 Strategy aims

In order to realise the Vision, the following draft aims are proposed in respect of on-street vehicle charging:

- Deliver an on-street electric vehicle charging network that meets the demands of B&NES residents, businesses and visitors in the context of wider transport aims which first aim to reduce vehicle use and promote public transport and active modes.
- Take a pro-active approach to provision of electric vehicle parking, such that charging infrastructure need not be a constraint to owning an electric vehicle for residents of B&NES.
- Ensure that appropriate provision is in place electric vehicle charging in neighbourhoods and residents parking areas across B&NES by 2030 in line with increasing demand.
- Ensure that on-street EV charging sites are designed to take into consideration all road users and in particular to ensure that the location of the charge point does not take valuable pedestrian space and takes steps to reduce street clutter where possible.
- Ensure provision of electric vehicle charging facilities on-street is guided by an overarching strategy which includes a detailed plan for appropriate energy supply and ensures a co-ordinated approach to the provision of infrastructure and supporting systems (for example, payment and enforcement).
- Ensure that the design of electric vehicle charging points responds to local circumstances and in particular is in keeping with the World Heritage Site and Conservation Area status of key areas of B&NES.

1.6 Purpose of this document

This report outlines the strategy and policies for taking forward on-street EV charging in B&NES. Whilst Bath is the predominant focus of this strategy, the policies will be applicable throughout the B&NES authority area. Therefore, where relevant, consideration has been given to Bath, Keynsham, Midsomer Norton-Radstock and the wider rural area/villages.

The structure of this strategy document includes:

- Section 2 – A review of alignment with policy
- Section 3 – Details of current provision for electric vehicle charging across B&NES
- Section 4 – Estimate of likely future demand for on-street electric vehicle charging
- Section 5 – Issues and options for on-street electric vehicle charging
- Section 6 – Approach to implementing on-street electric vehicle charging.

Appendix A provides a detailed policy review and **Appendix B** provides case study information.

2. Policy context

The provision of infrastructure to support electric vehicle charging directly reflects policy priorities at both the national and local level. Table 2-1 highlights the main policy linkages, showing how on-street electric vehicle charging would help to support the achievement of aims and ambitions set out in existing adopted policy covering, in particular delivering against West of England and B&NES priorities.

Generally, adopted policies highlight the need to focus on moving away from prioritising the private vehicle to benefit public health through improvements to local air quality.

Importantly the table highlights the importance that national, regional and local policies place on reducing transport emissions. For unavoidable trips increased electric vehicle charging provision would support the switch from highly polluting diesel and petrol alternatives.

Locally, the West of England Authorities are jointly working on a policy statement on ultra-low and low-emission vehicles. This statement, currently in draft, recognises the importance of providing appropriate electric vehicle charging infrastructure, including on-street provision.

Appendix A provides a full review of policy context relevant to electric vehicle and public on-street charging in particular.

Table 2-1: National, regional and local policy supporting on-street EV charging

Existing policy	How on-street EV charging will help achieve these policy aims
National Policies	
The National Planning Policy Framework	The NPPF is a land-use planning policy which promotes sustainable development of housing and transport infrastructure. Parking and new development guidance in the policy establishes that adequate provision of spaces for charging plug-in and ultra-low emission vehicles should be considered, therefore supporting appropriate and accessible provision of on-street EV charging points.
Clean Air Strategy 2019	The national Clean Air Strategy encourages the creation of Clean Air Zones to reduce air pollution in local areas. Through this, a CAZ is being introduced in Bath which will prompt vehicle upgrade and behaviour change. This policy aims to improve air quality and reduce vehicle emissions which will be supported through increasing on-street EV charging infrastructure across B&NES.
The Road to Zero	The Road to Zero supports a reduction in greenhouse gases, specifically through reducing vehicle emissions and prompting cleaner vehicles on UK roads. It aims to increase the development of zero emission vehicles in the UK through restricting the sales of conventional petrol and diesel cars in line with national legislation. This will be supported and facilitated in B&NES by the development of an on-street EV charging network.
The Clean Growth Strategy	The Clean Growth Strategy sets out the government approach for decarbonising the UK economy through the 2020s. One of the policies for reducing the transport emissions is to develop the electric vehicle charging network which will be supported by the development of on-street EV charging across B&NES.
Automated and Electric Vehicles Act	The Act is intended to support the delivery of electric vehicles through powers to allow the Government to regulate public electric charging which standardises the compatibility, payment and reliability of charging points.
Decarbonising Transport, Setting the Challenge	The Decarbonising Transport strategy sets out aims to deliver a net zero transport system which include accelerating the decarbonisation of road transport and support the transition to zero emission road vehicles. Through the delivery of on-street EV infrastructure in B&NES, this can help support the delivery of the Decarbonising Transport report.
Regional/Local Policies	
West of England Joint Local Transport Plan 2020	The JTL4 sets out the transport aspirations for the West of England up to 2036 including aims to support the development and uptake of ULEVs. The implementation of an on-street EV strategy in B&NES is key to enable and drive the shift to electric vehicles, therefore helping to deliver the reduce carbon emissions and improve air quality. It should be noted that the B&NES on-street EV strategy should consider the improvements outlined within the JTL4 and be delivered alongside these.
West of England ULEV Strategy (emerging and currently draft)	The West of England authorities are working on a draft ULEV strategy which will encourage and support a shift to carbon neutral transport across the region. It will identify a range of actions and objectives, including increasing electric charging points. Provision of infrastructure to support electric vehicles is recognised as critical. By setting out an

Existing policy	How on-street EV charging will help achieve these policy aims
	approach to provision of on-street charging facilities within B&NES this document aligns fully with the West of England's emerging regional policy.
Bath and North East Somerset Draft Corporate Strategy 2020 -2024	The Corporate Strategy sets out the overarching strategic plan for the Council which including a reduction in transport emissions. The Strategy details the key commitment to introduce on-street EV charging working with schools and local communities which this policy directly supports.
The Getting Around Bath Transport Strategy	The Getting Around Bath Transport Strategy outlines the aims and objectives for transport within Bath. It outlines the support of residents during consultation for electric vehicle facilities within the city centre. This policy will support the consultation comments and policies within the Strategy for reductions in carbon emissions.
Existing B&NES local plan (Core Strategy and Placemaking Plan)	The local plan details the vision for development across B&NES. The Core Strategy outlines the objectives which includes a sustainable, low carbon future which will be supported through the development of on-street EV charging.
Emerging B&NES Local Plan	The Emerging Local Plan sets out the future aspirations for development across B&NES. The Plan is supportive of reducing carbon emissions and providing electric vehicle infrastructure. It supports electric vehicle infrastructure through new developments.
The City of Bath World Heritage Site Management Plan 2016-2022	The World Heritage Site Management Plan identifies traffic as a major issue for the World Heritage Site and aims to promote less car use and improve air quality. The implementation of on-street EV charging points should consider the distinct nature of the World Heritage Site to ensure appropriate installation for the streetscape.
Bath City-wide Character Appraisal	The document outlines the 22 character areas recognizing the World Heritage Site, Hot Springs, Conservation Areas, Green Belt, Areas of Outstanding Natural Beauty, Listed Buildings, Ancient Monuments and historic landscapes. Consideration of these areas is required in the implementation of on-street EV charging infrastructure to establish suitable locations, materials and design.
Balancing Your Needs: A parking strategy for Bath and North East Somerset	The Parking Strategy supports electric vehicle provision with support for an increase in the number of electric vehicle charging points on-street and within car parks. This strategy will build on the policy commitment through delivering a framework for on-street EV charging.
B&NES Climate Emergency Progress Report	The Climate Emergency report details B&NES' commitment to carbon neutrality by 2030 which includes aims to increase electric vehicle uptake across B&NES. The EV strategy will help to enable the shift to electric vehicles as set out in the on-road transport targets.
Bath Clean Air Plan	The Clean Air Plan is anticipated to increase the uptake of electric vehicles within Bath which has informed the development of the EV on-street charging policy – particularly future fleet composition assumptions and consideration of infrastructure provision. An EV strategy would help to enable the shift to electric vehicles as set out in the on-road transport targets.
Air Quality Action Plans for Keynsham and Saltford	It is estimated that electric vehicle ownership will increase across Keynsham and Saltford as a result of the plan. The electric vehicle on-street charging policies and consideration of infrastructure provision as part of this Strategy document will take account of these air quality action plans.

It should be noted that OLEV have recently revised guidance on funding for on-street EV charging available to local authorities. This includes the On-Street Residential Grant Scheme (May 2020⁴), which enables local authorities to apply to access up to 75% of the cost of on-street EV charge point infrastructure. Further information on the grant scheme is summarised in **Appendix A**.

⁴ <https://www.gov.uk/government/publications/grants-for-local-authorities-to-provide-residential-on-street-chargepoints/grants-to-provide-residential-on-street-chargepoints-for-plug-in-electric-vehicles-guidance-for-local-authorities>

3. Current provision for electric vehicle charging in B&NES

This section provides an overview of the current provision of electric vehicle charging infrastructure across B&NES. Overall this shows that whilst provision is increasing, the availability of charging facilities within residential areas is limited and currently there are no public on-street facilities.

3.1 Bath

Currently, there is no provision of on-street EV charging in Bath. There are 16 off-street electric vehicle charging locations with a total of 77 charging points. Most of these are not close to the central area of the city and only 43, at 10 locations across Bath, are available for public use.

These electric vehicle charging locations are shown in Table 3-1. Data presented in this section has been obtained from the website www.zap-map.com⁵, in December 2019. No data on the utilisation of charging points is available.

Table 3-1: Existing electric vehicle charging points

Map ID	Location	Public / Private	Number and type
1	Charlotte Street Car Park	Public	5 x Type 2, Mid accelerated 7KW
2	Southgate Bath Shopping Centre	Public	12 x Type 2, Mid accelerated 7KW
3	The Royal Crescent Hotel & Spa, 16 Royal Crescent	Private	2 x Type 2, Accelerated 22KW
4	Apex City of Bath Hotel	Private	4 x Type 2, Mid accelerated 7KW
5	Bloomfield House, 146 Bloomfield Road	Public	1 x Type 2, Mid accelerated 7KW 1 x British plug, Standard 3KW
6	University of Bath, east car park	Private	8 x Type 2, Mid accelerated 7KW
7	University of Bath, west car park	Private	6 x Type 2, Mid accelerated 7KW
8	Bailbrook House Hotel, Eveleigh Avenue	Public	1 x Type 2, Fast 43KW 1 x Combo CCS EU, Fast 50KW 1 x CHADEMO, Fast 50KW
9	Stay In Bath – The Courtyard, 246 High Street	Public	1 x Type 2, Mid accelerated 7KW 2 x Tesla, Accelerated 22KW
10	Odd Down Park & Ride, Odd Down	Public	4 x Type 2, Mid accelerated 7KW
11	Sirona Care and Health, St. Martin's Hospital	Private	2 x Type 2, Mid accelerated 7KW
12	Sainsburys Odd Down, 152 Frome Road	Public	2 x Type 2, Standard 3KW
13	Newbridge Park & Ride, Upper Bristol Road	Public	4 x Type 2, Mid accelerated 7KW
14	Lansdown Park & Ride, Lansdown Road	Public	4 x Type 2, Mid accelerated 7KW
15	Bath Spa University	Private	12 x Type 2, Mid accelerated 7KW
16	Bath Spa University (Academic Building)	Public	4 x Type 2, Mid accelerated 7KW

There are two publicly available charging locations within Bath city centre, at the Charlotte Street and Southgate Shopping Centre car parks. Between them, they provide 17 charging points. There are also private charging points within the centre of the city at the Royal Crescent and Apex City of Bath hotels.

The remaining twelve charging point locations are further away from the city centre. However, three of them are in car parks of Park & Ride sites in Odd Down, Newbridge and Lansdown (locations 10, 13 and 14 respectively), allowing drivers of electric vehicles from further afield to catch a bus to the city centre and leave their car parked and charging. Figure 3-1 shows each of these charging points, in relation to the residential parking zones.

⁵ As hosted through part of Go Ultra Low West project.

Figure 3-1: Electric vehicle charging points

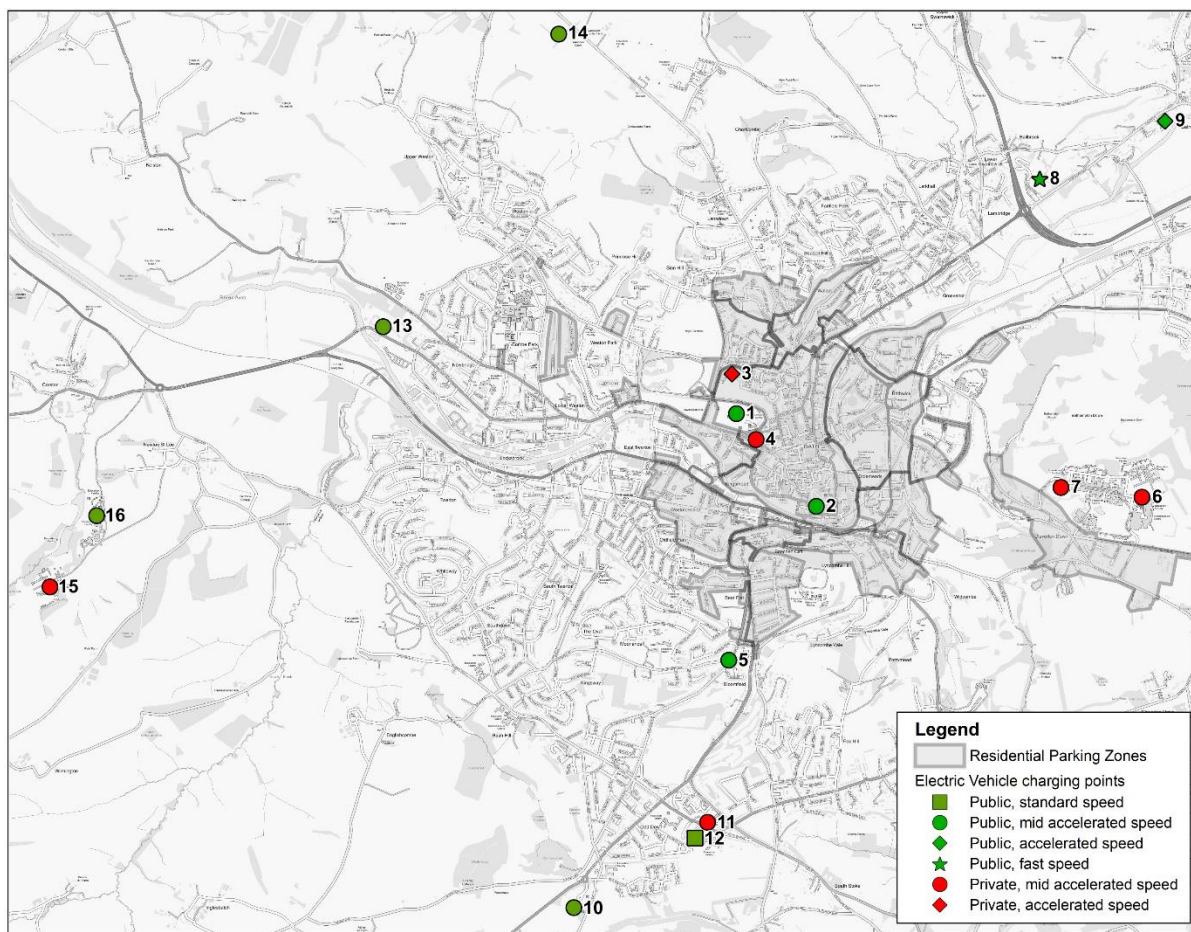


Figure 3-1 demonstrates that there are few options for EV charging in B&NES, with no current on-street EV charging points for use in residential areas. There is a need for increased provision of electric vehicle charging and parking within residential areas.

3.2 Electric vehicle charging across the wider B&NES area

Across the wider B&NES area the level of provision is similar and is set out below. Although public charging locations, those designated with an asterisk (*) require membership, double asterisk (**) require notice.

Keynsham

- Tesco superstore, Keynsham – four public charging points (Type 2, Mid accelerated - over 2kW)
- Fox and Hounds car park, Keynsham – two public charging points (Type 2, Mid accelerated - over 2kW)

Midsomer Norton – Radstock

- Best Western Centurion Hotel - two public charging points (BS1363 3 pin amp, Mid accelerated - over 2kW)
- Midsomer Norton Sports Centre - two public charging points* (Type 2, Mid accelerated - over 2kW)
- Ston Easton Park Hotel, Radstock – two public charging points* (Tesla Model S/X, Mid accelerated - over 2kW)

Rural areas/villages

- Babington House, Frome - one public charging point** (Tesla Model S/X, Mid accelerated - over 2kW)
- Chew Magna – one public charging point (CHAdeMO, High accelerated - over 40kW)
- The Old Parsonage, Farrington Gurney – one public charging point* (Tesla Model S/X, Mid accelerated - over 2kW)

- Temple Inn Lane, Temple Cloud, Clutton – two public charging points (Type 2, Mid accelerated - over 2kW).
- Upper Vobster Farm, Upper Voster - two public charging points* (Tesla Model S/X, Mid accelerated - over 2kW)

It is noted that possible additional future public off-street charging locations within B&NES have been identified as part of the Go Ultra Low West Project⁶, with approximately 15 sites under investigation.

⁶ <http://bcc.maps.arcgis.com/apps/webappviewer/index.html?id=c65b68b9282e43e994130b5f591c685e>

4. Future demand for on-street electric vehicle charging in B&NES

Overall B&NES Council, along with the other West of England authorities, recognises the need for vehicle use to fall substantially in future. However, the private car will remain necessary for some trips and it is important that residents have good access to key facilities. Where vehicles are required, the Council aims to encourage a step change towards vehicles that produce zero carbon emissions. This will mean that an increasing number of residents will require easy access to EV charging.

4.1 Recent trends

In 2019 Q2, 14,811 ULEVs were registered for the first time in the UK, which is a 30% increase on 2017 Q2⁷. More locally, vehicle licensing statistics published by the Department for Transport (DfT) state that an average (across the four quarters) of 419 ultra-low emission vehicles (ULEV), fully electric or plug-in hybrid vehicles were registered in B&NES in 2018, which represents 0.37% of total vehicle registrations. However, it is important to note that this is an increase from an average of 40 registrations in 2014, which shows a considerable uptake in five years. Therefore, as ULEVs become more mainstream within Bath, more on-street EV charging infrastructure will be required.

4.2 Future electric vehicle demand in residential areas

A range of analysis has been undertaken to understand the potential future demand for on-street EV spaces that may be required in each of the existing residents parking zones in Bath, based on different available data sources and predictions. Indications of the uptake of electric vehicles is used here as a proxy for demand for parking in residential areas (although it is recognised that the situation is complex and that actual demand for EV charging on-street is likely to relate to a number of other factors, such as the growth in provision at workplaces). Estimates of potential demand differs depending on the source data used. In summary the analysis for this strategy paper has considered:

- The TAG databook May 2019. This provides national estimates on the proportion of electric vehicles in the vehicle fleet mix in the future. This data suggests that 14% of car vehicle km will be by electric by 2030. The figure is 5.86% for LGVs and the databook assumes that OGV/PSV will remain 100% diesel.
- The Climate Emergency aspirations, as stated by in the B&NES Climate Emergency Progress Report, aim to see the number of vehicle-kms travelled in the city comprise of 76% fully electric and 14% by petrol-hybrid vehicles by 2030.

Utilising the TAG data implies that 14% vehicles could require access to electric charging points by 2030. Overnight charging is likely to be most practical for many electric vehicle users, therefore this assumes a potential need to provide up to 14 % of all on-street residential parking as electric vehicle parking by 2030. Actual demand could vary, as noted above, depending on the growth of other options for EV charging (which may mean that more people could charge other than at their home). Applying this percentage to the parking provision in the existing residents parking zones (RPZs) indicates there could be circa. 900 electric vehicles owned by Bath residents parking on-street by 2030. This figure is not intended to inform targets but provided as a quantified example.

As noted in section 5 there are a range of ways in which electric vehicle users could choose to charge their vehicle (meaning that not all demand would need to be met on-street), but these figures provide an overall indication of the scale of infrastructure that could be required to meet demand. To support this aspiration, B&NES Council will need to consider the feasibility of on-street EV charging provision alongside the likely advancements in EV charging technology and wider adoption of road traffic reduction measures.

The Climate Emergency aspirations would imply an even higher demand for potential on-street electric vehicle charging infrastructure. Given the various constraints (see section 5) provision to this extent on-street in residential areas is unlikely to be feasible.

⁷ <https://www.gov.uk/government/statistical-data-sets/all-vehicles-veh01#ultra-low-emissions-vehicles>

5. Issues and options for developing the on-street EV network

5.1 Options for EV provision

Demand for residents to charge electric vehicles could potentially be met in a number of ways via:

- public car parks, for example where residents live close to public car parks there is an opportunity for them to charge overnight, close to their home. This facility is already available in B&NES in some car parks;
- at workplaces, facilitating charging during the day;
- private provision, for example at people's homes/on driveways (note that within sensitive areas this may require appropriate consents); and
- on-street.

On-street EV charging is therefore not the only option available for increasing provision of EV charging within B&NES. However, for many residents the other options are unlikely to provide satisfactory levels of convenience.

This is particularly the case in areas of Bath, for example, where a high proportion of housing is terraced or multiple occupancy without access to off-street parking. Therefore provision of on-street facilities needs to be part of the overall package of EV charging infrastructure. The extent to which it is required, as discussed in section 4, may depend on the growth of provision in other areas and the extent to which, for example ability to charge in public car parks or workplaces may negate a need to charge at home.

Stronger policies and targets for the provision of public EV charging is expected through emerging policies, including the West of England policy statement on ULEVs.

5.2 On-street electric vehicle charging infrastructure options

There are a number of on-street charging options currently available, the considerations relevant to each option are summarised in Table 5-1. Technology is advancing rapidly and it is envisaged that other options will be brought to market in the near future; therefore it is important that B&NES continue to monitor potential solutions and explore new opportunities.

Table 5-1: Current electric vehicle charging options for on-street provision

Type of on street charging provision and enforcement	Considerations
Lamp post and low power charging points. (3-5kW) TRO may be required to keep spaces free for use by electric vehicles only	<ul style="list-style-type: none"> + Removes need for additional street furniture. + Helps to keep costs of equipment etc. down. Less expensive than floor mounted units. + Able to piggyback onto existing power supply. - Limited charging capacity which means a full charge takes 7-8 hours, mostly only suitable for overnight charging only. - In some areas, potentially limits number of spaces that can be provided, depending on location and number of existing lampposts. - Existing lamp posts may not be located close to convenient parking spaces. - Dedicated spaces required in residential streets with no RPZ. - Existing lamp posts may not be located at the front of the pavement and require a cable trail. Trailing cables may present trip hazard across the footway and particularly to pedestrians. - Users need to buy a Smart Cable (costs £199) – may prevent wider adoption. - In areas with RPZ, to preserve preferential access for local people rather than all EV drivers, locally based EV permits may be required.

Type of on street charging provision and enforcement	Considerations
Floor mounted charging points TRO may be required to keep spaces free for use by electric vehicles only 7-22kW	<ul style="list-style-type: none"> + Charging takes 3-4 hours + Small size, well suited to on-street EV charging + Typically able to serve two EVs at a time - Require dedicated EV parking bays. This may add to parking pressure in area. - Need to enforce maximum stay for EV parking bays these charging points are assigned to ensure once a vehicle is charged it moves on to free up the space for the next EV user. - Simple payment system once registered. - Installation could be more expensive as is likely to require a new connection to the power supply - Require street space for installation – preference for location on-street, not on pavement - In areas with RPZ, to preserve preferential access for local people rather than all EV drivers, locally based EV permits may be required.
Rapid charging points 43- 50kW	<ul style="list-style-type: none"> + Charge a vehicle in less than 1 hour + Has various cables to enable use by different connector types. - Large size and only really suitable for off-street locations or would require a large amount of street space. - Require a new connection to the power supply. - Can require costly local electric grid upgrades. - Can only serve one vehicle at a time. - Only suit certain electric vehicle types.

Overall consideration of the information in the Table 5.1 suggests that lamppost-charging and bollards are typically the most suitable options for on-street provision. However, it is noted that each option has specific issues and that different options can work better in different local situations. In particular, the position of existing lamp columns (i.e. at the rear or front of the footway) is critical; with many in Bath positioned at the rear of the footway, which therefore raises safety concerns around trailing cables for plugging in. Other authorities are carrying out trials of different on-street technologies. The case study below highlights the Oxford experience, which includes an option involving cables running through pavement drainage channels considered for both on-street and household options. However, B&NES has noted that this has implementation and continued maintenance implications and is therefore not suitable for use locally.

Case Study: Oxford City Council – electric vehicle charging (for full details see Appendix B)

Oxford City Council trialled five different on-street EV charging technologies in 2018, including lamp post chargers, three types of bollard chargers and a home charger coupled with a channel (often utilising existing drainage channels) to allow the cable to be trailed across the footpath.

The criteria used to evaluate the performance of the charging technologies were:

- Ease of access
- Ease of use
- Installation footprint
- Robustness
- Data and billing
- Maintenance and repair
- Price
- Speed of charging
- Utilisation
- Adoption capacity
- Neighbour complaints
- Commercial sustainability

Each technology was scored against each criteria, with 1 being very poor / low and 5 being very good / high. The lamppost charger scored the best overall, followed by the home charger. The bollard style chargers scored lowest.

5.3 Challenges and issues for B&NES

Provision of on-street EV parking in dense residential areas, as is common in Bath and other B&NES towns, presents a number of possible challenges:

- One of the potential constraints to developing the EV charging network in B&NES, as in other authorities is the capacity of the local electricity grid. Depending on the types of on-street charge points installed, it is possible that upgrades would be required to grow the capacity of the local grid or to manage demand in a smart way (i.e. consideration of peak times).
- Limited road space/installation footprint required. Provision of space/infrastructure for charging should typically be within the highway, otherwise it potentially undermines facilities for pedestrians. Moving forwards B&NES will aim to ensure that all infrastructure should be installed within the highway where possible. In some circumstances the Council may consider the use of footways where the remaining footway after installation will exceed 2.5m.
- Potential impact on footway – as noted above, the need to physically ‘plug in’ has further knock on effects for the footway and raises safety issues in respect of trailing cables etc. Although use of drainage channels within the footway has been trialled in other areas to reduce the impact of trailing cables, B&NES will not consider these as an option in tandem with lamppost or household charging, therefore overall design will need to eliminate the risk of trailing cables using other means.
- Street furniture – depending on the provision, there may be the need for additional street furniture. In some areas this will require careful consideration, for example in the World Heritage Site or Conservation Areas.
- Ease of access – in terms of proximity to peoples’ homes and availability of bays.
- Regulation and enforcement - there are a number of options available to regulate and enforce bays associated with on-street EV charging, each depends on the existing parking restrictions in an area:
 - A time-limited TRO could be used to place restriction on electric car charging spaces, particularly in areas where there is not an RPZ. The TRO would determine the use of the space - establishing that only electric cars charging could use it, the length of stay, the time before return and exceptions to this. As well determining the time period for which the restrictions are in use (i.e. 24 hours, 7 days a week, or restrictions could apply for set times and days).
 - Spaces could also be enforced via specific RPZ TRO regulations. Therefore, only residents with a permit for the RPZ, or visitors to residents in the zone with a visitor permit would be able to use the space. Outside of an RPZ, any vehicle would be able to use the space provided it fits with the TRO restrictions.
 - In some instances, a permitting review may be required to enable drivers with electric vehicle permits for an area only to use the charging point. This prevents non-EV vehicles parking in these spots and EVs that are not local to the area using the infrastructure, unless a visitor pass available.
- Robustness and maintenance – on-street EV charge points can require extensive maintenance over their lifetime. There may be issues in funding this maintenance. Infrastructure needs to be resilient to vandalism and be able to withstand minor collisions which may be more likely if located in the highway.
- Visual impact – Bath is a heritage city and on-street charge point options may have a negative visual impact. Charge points typically have a modern design and can be large in size, which might look out of place in particular areas of the city. Lamppost charge points can make use of existing infrastructure and may have less of a visual impact than other options.
- Houses in multiple occupation/AirBnB etc – these residences may present challenges in terms of determination of access to charge points. However, visitor permitting or a set number of permits per household (similar to RPZ policies) may mitigate some of these issues.
- Ease of use and payment mechanisms – to include how intuitive the system is for use. Various payment and access options are currently available ranging from open access, plug in and go systems through to restricted access points requiring tag access.
- Commercial sustainability – to ensure systems are, where possible, cost neutral to the Council.

6. Approach for the implementation of on-street electric vehicle charging in B&NES

This section sets out steps that B&NES should take to move forward on the implementation of on-street charging for electric vehicles. Section 6.2 considers the considerations to take forward electric vehicle charging in specific areas, for example as opportunities arise linked to the wider implementation of strategies such as low traffic neighbourhoods or in response to requests. Ahead of this, section 6.1 considers the wider issues that the Council should consider in order to further develop an authority wide approach and to prioritise implementation.

6.1 Development of a framework for on-street EV charging within B&NES

In order to ensure a holistic, joined-up and deliverable overall approach to the implementation of electric vehicle charging, B&NES will need to develop a framework to identify how best to roll out enhanced provision across the authority. This will need to balance:

- The need to proactively encourage a switch to low emission vehicles;
- The need to cater for increasing demand over time; and
- The need to address practical constraints.

The roll out of low traffic neighbourhoods across the authority offers a mechanism through which EV provision can be considered for each individual area in turn, within a wider context of local improvements. However, it is also important to consider the over-arching, pre-requisite requirements necessary to support this roll out. Key issues for consideration include:

- The long-term capacity of the local electricity grid to support an increase in on-street EV charging (and alongside increasing provision of other forms of EV infrastructure in line with the wider strategy for the region).
- Identification of the most appropriate infrastructure and technology for on-street EV charging in B&NES.
- Advancements in technology and the need to stay abreast of a changing market.
- Funding.
- Priority areas for implementation, as seen in the context of demand, or opportunities to implement changes alongside other works.

Action Point: B&NES will identify and confirm the requirements necessary to support the roll out of on-street EV charging across residential areas. Requests can be submitted by local councillors using the proforma template in **Appendix C**, this will enable B&NES Officers to gauge level of interest. This will help to ensure that the provision of EV charging facilities on-street within low traffic neighbourhoods, or as other opportunities arise, is undertaken within the framework of a wider strategy.

6.1.1 Capacity of the network

As the number of electric vehicles increases, smart charging infrastructure and grid balancing technology will become increasingly important. Peak electricity demand is typically in the evening, and research shows that most people currently charge their vehicles at this time too. Home heating is also turning to electric, with gas heating for new houses due to be banned by 2025. This will further increase the load on the already strained electricity grid at peak times.

To manage this demand and minimise the need for new power generation and costly electricity grid upgrades, smart charging will be increasingly important. Smart charging can shift charging times to the middle of the night or other off-peak times to minimise the load on the grid. Other smart charging approaches allow the load on the grid to be levelled meaning that multiple vehicles charging in one location have power split between them to help manage the load on the network.

Emerging technology such as Vehicle-to-Grid (V2G), where electric vehicle batteries contribute power to the grid at peak times, could also play an important role, along with smart grids and battery storage.

In 2019 Government consulted on proposals for regulations to ensure that electric vehicle charge points in the UK have smart charging functionality included. The results of the consultation are currently being analysed by Government.

It will be important to establish the capacity of the local network, identify any constraints and consider approaches for managing impact in order that the roll out of on-street EV charging infrastructure, alongside wider initiatives to provide other forms of EV charging is sustainable.

As part of an overarching framework, consideration should also be given to the source of supplied energy. The existing 'revive' network is supplied using 100% renewable energy. Ensuring a high percentage of renewable energy should similarly be a high priority for B&NES.

Action Point: B&NES will establish the local factors affecting grid capacity and constraints and continue to support smart charging research and innovation, working with Government and other partners and identify potential funding opportunities and projects.

6.1.2 Infrastructure, technology and method of charging

As noted in section 5, various options for provision on on-street EV charging are available, each with their own specific advantages and disadvantages. Currently B&NES does not have a preferred solution for on-street charging. In order for the roll out of EV on-street charging to be practical and cost effective it will be important for B&NES to continue to liaise with manufacturers to establish the best approach for the local area. This may involve the need to test various approaches (including charging equipment, method of charging and subscription services) and monitor.

Across the wider region, the WoE authorities have taken a leading role in developing the 'revive' public charging network in the region. Lessons from this project will be used to determine a preferred approach for B&NES.

Tariffs and payment mechanisms will be critical considerations. In the context of on-street EV charging provision, an important consideration is that the costs of residential on-street charging are likely to be higher than residents with off-street parking, due to higher electricity prices and maintenance costs. This will be a key consideration and will require development of ways to tackle this across B&NES to avoid discrimination against lower income households. Overall, charging approaches will need to be in line with the Automated and Electric Vehicles Act 2018, which aims to ensure that public charging points are compatible with all vehicles, standardising the payment at charging points and setting standards for reliability.

Currently off-street charging points in B&NES are provided by a range of different providers. The framework should consider whether future provision should be via a preferred supplier, or whether a range can/should be maintained.

An overall method of managing the whole on-street provision should also be considered and specifically whether charge points should be Council-owned and/or run by another organisation. As part of establishing a preferred solution/supplier(s) it will be important to give due consideration to design issues such that the infrastructure/systems adopted are suitable for use within the World Heritage Site or local conservation areas.

Action Point: B&NES will explore options for equipment and services with a view to establishing a preferred supplier(s) and methods for charging.

6.1.3 Changing technology and trends

It will be important for the Council to keep abreast of emerging technologies and charging options as they develop to ensure infrastructure remains fit for purpose and meets the needs and demands of users. Important considerations include for example

- Battery size – the size of batteries is expected to improve significantly in future, which will affect demand for charging.
- Induction charging – this is being developed and would remove the need for a vehicle to be physically plugged in to a charge. Instead working on the basis of a transmission of energy from a charging pad to a vehicle parked above.

- Ability to charge other than at home – as opportunities to charge vehicles in other locations increases, demand for on-street charging at home may alter (albeit it is recognised that for many users access to overnight charging at home is critical).

In addition, it is essential to monitor future trends and demand. Overall vehicle use needs to fall substantially in order to address the Climate Emergency. Mode shift and changing travel pattern over time will have a direct impact on demand for EV charging.

Action Point: B&NES will continue to keep abreast of emerging technologies to ensure that the most appropriate solutions to on street electric vehicle charging are adopted across the authority.

6.1.4 Funding

As part of an overarching strategy a key consideration will be to establish how on-street charging facilities can be funded and to establish the likely provision that can be made within available funding. In this way, implementation can be programmed and prioritised. Overall, the provision of on-street charging electric vehicle infrastructure should remain cost neutral wherever possible so as not become a financial burden on the council.

Action Point: B&NES will continue to identify funding opportunities to deliver on-street vehicle charging. Implementation of on street facilities will depend on, and be prioritised according to, available funding.

6.1.5 Priority areas for implementation

As part of the overarching framework it will be important for the Council to set out how it intends to roll out on-street electric vehicle provision and how this would be prioritised. Priorities within the framework could reflect:

- Opportunities to deliver on street electric vehicle charging as part of an integrated and wider intervention in a particular area. It is envisaged that priority will be given to EV provision alongside other works or wider projects. In particular low traffic neighbourhoods offer a key opportunity to provide EV infrastructure alongside wider improvements and public realm enhancements.
- Extent of demand/EV ownership in particular areas – for example as demonstrated through a request for bays or known increase in EV ownership.
- Availability of alternative EV charging options – for example, on-street provision may be ranked higher priority in those areas where other options, for example use of public car parks etc is not feasible.
- Opportunities for provision to be funded via alternative means, for example if specific local funding is available.
- Consideration of future provision as part of a process of reviewing or implementing parking restrictions, residents parking zones or other traffic regulation orders (TROs).

Action Point: B&NES will consider the roll out of on-street EV charging based on a prioritisation framework and will routinely monitor levels of EV ownership across B&NES.

6.2 Process for implementing EV provision

The following process highlights how EV on-street provision could be taken forward in the short term whilst the wider WoE ULEV strategy is developed and B&NES framework for on-street EV charging evolves. This process seeks to prioritise implementation and ensure that installation of on-street infrastructure responds to local circumstances and contexts. It outlines the broad stages for consideration and implementation of on-street EV charging. It also provides guidance on considerations for prioritisation and proportionality, with the timeframe for this process varying on a location-by-location basis. Table 6-1 provides additional details for consideration.

It should be noted that a request for EV on-street charging facilities may not always result in provision being delivered and that it will be important for implementation to be prioritised to make best use of available funding.

In the short-term, implementation could be taken forward in the form of trials, which would help to determine a firmer longer-term approach.

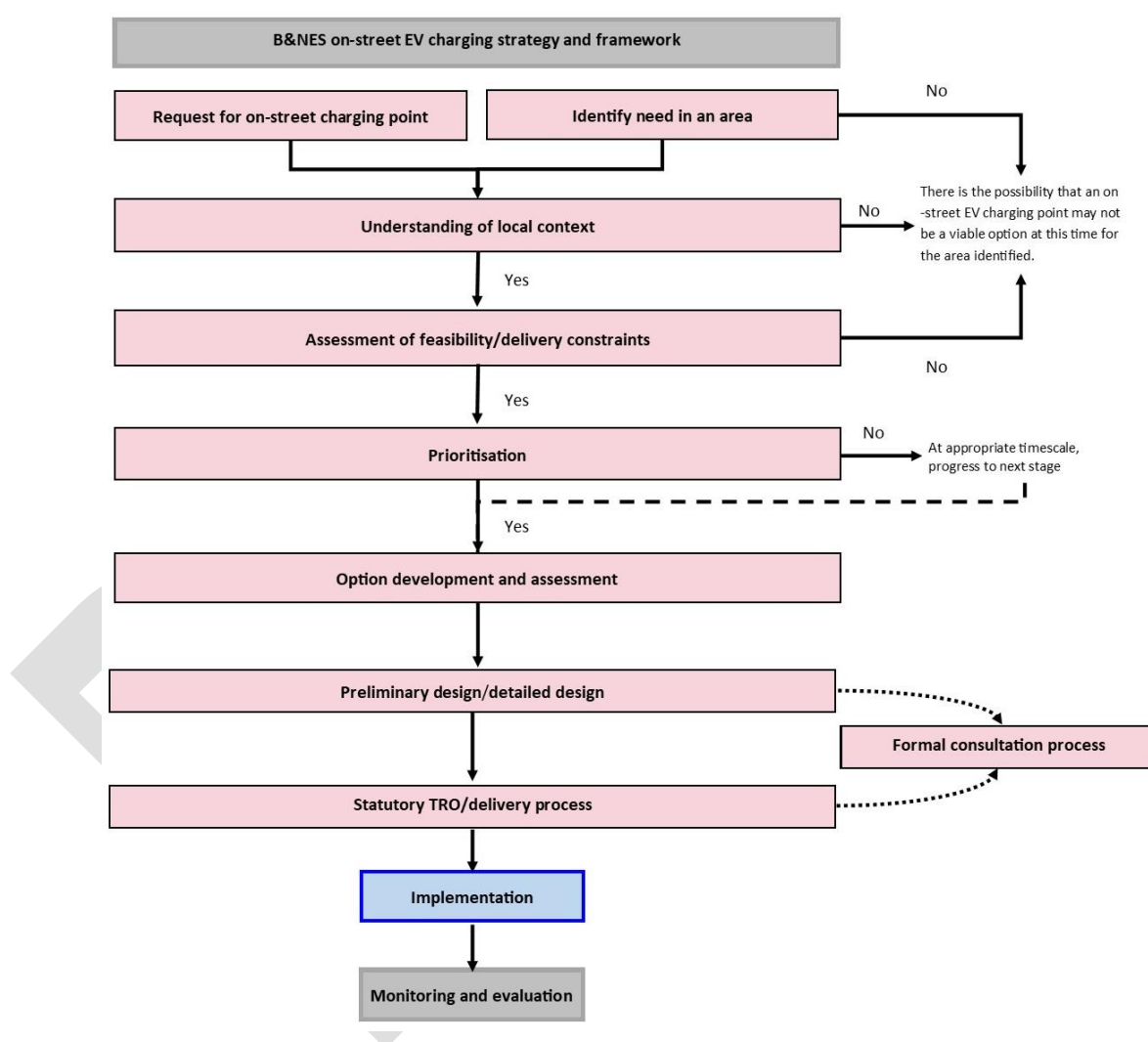


Figure 6-1: Summary process for consideration and implementation of on-street EV charging infrastructure

Table 6-1: Process for developing of on-street EV charging options and proposals

Stage of process	
IDENTIFY NEED	<div> <div>Identification of need for increased EV charging in an area to facilitate implementation of transport strategy or as part of low traffic neighbourhood.</div> <div>Request for on-street EV charging in an area received via proforma template. This could be in response to community engagement or individual requests.</div> </div>
	<i>Requires an understanding of supply and demand issues.</i>
UNDERSTANDING OF LOCAL CONTEXT	<p>At this initial stage, there are a number of considerations which include:</p> <ul style="list-style-type: none"> ▪ understanding of current demand and availability of EV charging supply within the area; ▪ additional requests in an area and links to wider TRO review timescales; ▪ strength of local support; and ▪ consideration of future demand/uptake and information on intended use (i.e. times of day).
	<i>Could on-street EV charging be feasible?</i>
ASSESS FEASIBILITY/DELIVERY CONSTRAINTS	<p>Undertake desktop review using existing information, to include:</p> <ul style="list-style-type: none"> ▪ proximity to public off-street EV charging facilities; ▪ parking availability, any restrictions (including RPZ, TROs) and usage, including proportion of dwellings with off-street parking; ▪ availability of connections to electricity supply, e.g. via existing lampposts; ▪ heritage and conservation considerations; ▪ pavement and road widths; ▪ landscape geography; ▪ street infrastructure (e.g. lamppost frequency); ▪ information on local fleet mix; and ▪ consideration of opportunities to deliver as part of wider intervention – e.g. low traffic neighbourhoods, existing TRO reviews or as part of wider transport strategy considerations. <p>The desktop review may include a site walk and initial fact-finding engagement with the local community, through suitable means such as residents' associations or parish councils.</p> <p>This review will provide an initial determination of the appropriateness of on-street EV charging infrastructure.</p> <p>Further data collection (such as parking surveys) and feasibility considerations may be required.</p>
	<i>If on-street charging infrastructure is feasible, locations will be assessed to enable prioritisation.</i>
PRIORITISATION	<p>Following feasibility considerations and further data collection, locations will be assessed and considered at both a local and area-wide scale, identifying opportunities for delivery as part of wider interventions and considering available funding. Section 6.1.4 considers what priorities could reflect.</p>
	<i>If on-street charging infrastructure is prioritised and feasible, what technology options are most appropriate for this location?</i>

Stage of process	
OPTION DEVELOPMENT AND ASSESSMENT	<p>Additional consideration and assessment of the following may be included at this stage to develop location-specific, viable on-street charging options:</p> <ul style="list-style-type: none"> existing width of pavement, at specific locations; location of street infrastructure; parking availability and use within existing RPZs or in the vicinity of the area; likelihood and impact of increased parking pressure; likelihood of need for controls/enforcement, e.g. a TRO or parking controls; likelihood of local support of the principle. <p>This information will determine the on-street EV charging options most suited to this area (lamppost chargers or bollard style chargers).</p> <p>Assessment of factors that could impact the implementation of on-street charging infrastructure in this area.</p> <ul style="list-style-type: none"> Funding: is there funding available, if yes how much? Permits: would options require residential electric vehicle permits to prevent use from non-local users? Would options require TROs? What would be likely timescales for implementation? <p>Following development of on-street EV charging options, these will be considered in terms of the initial prioritisation, the proposed scheme(s) including high-level consideration of costs and timeframes associated with any solution.</p>
	<p><i>Take forward preferred option/solution</i></p>
PRELIMINARY DESIGN & DETAILED DESIGN	<p>This would could include consideration of full implications of design issues/trade-offs, timescales for intervention and cost.</p> <p>Designs should be in accordance with existing B&NES street design guidance and should consider, as appropriate, low traffic neighbourhoods proposals and existing TROs/RPZs.</p> <p>Risk and equality implications also need to be considered at this time.</p> <p>Community engagement, prior to formal consultation, should also be considered as part of the development of preliminary and detailed design.</p>
STATUTORY TRO/ DELIVERY PROCESS	<p>Depending on the final scheme designs, the relevant statutory TRO formal consultation and delivery processes should be followed for implementation.</p>
IMPLEMENTATION	<p>To include ongoing communication with the community during the construction phase via newsletters, website, information boards etc. as appropriate.</p>
'AFTER' MONITORING	<p>Appropriate 'after' monitoring should be undertaken to properly evaluate the impact of the scheme. This should include, as appropriate:</p> <ul style="list-style-type: none"> quantitative data on usage, failure and maintenance; and qualitative surveys of community and business opinion.

7. Summary and way forward

The provision of on-street electric vehicle charging points across B&NES will be an important part of the overall package of measures required to encourage use of zero- and low-emission vehicles, as well as address the Climate Emergency. This needs to be taken forward in the context of wider policy and actions relating to broader measures to encourage and support the use of ULEVs across the region.

On-street provision presents a number of challenges, particularly within the types of residential areas and sensitive urban environments that are common across B&NES.

In order to take forward a well-planned and integrated strategy for delivering on-street charging facilities more work is required to establish key overarching principles and processes, for example in relation to:

- How provision can be delivered in a way that is compatible with the overall capacity of the local electricity grid.
- Identification of the most appropriate infrastructure and technology and systems for on-street EV charging in B&NES.
- How the overall strategy can continue to keep up-to-date and respond to advancements in technology.
- How on-street EV infrastructure can best be funded.
- How implementation of EV on-street charging facilities can most appropriately be prioritised to best meet demand and make best use of available funding.

In the short term, while the wider WoE ULEV strategy is developed and the B&NES framework for on-street EV charging evolves, proposals and requests for on-street EV facilities will need to be carefully considered so as ensure fit with a longer-term strategy. Trial areas will be useful in determining the best long-term approach and provide an opportunity for exploring options and monitoring outcomes.

Appendix A. Policy context

A.1 Introduction

The policy context for the implementation of on-street electric vehicle (EV) charging has two strands:

- Policies and strategies that support, or would be supported by, the development of on-street EV charging; and
- Legislation and guidance that can be used to implement on-street EV charging or should be considered for implementation.

These are considered separately in the following sections.

A.2 Policies and strategies that support, or would be supported by, on-street EV charging

The implementation of on-street EV charging across B&NES would align with and support a wide range of existing policy at both the national and local level. These include:

National Policy

- The National Planning Policy Framework (February 2019)
- Clean Air Strategy 2019 (January 2019)
- The Road to Zero (July 2018)
- The Clean Growth Strategy (October 2017)
- Automated and Electric Vehicles Act (2018)

Local Policy

- West of England Joint Local Transport Plan 4 2020-2036 (January 2020)
- West of England Ultra-Low Emission Vehicle Policy Strategy (note that this document is currently under preparation)
- Bath and North East Somerset Corporate Strategy and Medium-Term Financial Strategy 2020/21 – 2024/25 (December 2019)
- Getting Around Bath Transport Strategy (November 2014)
- Bath and North East Somerset Council's Core Strategy (July 2014)
- Bath and North East Somerset Council's Placemaking Plan (July 2017)
- Emerging Bath and North East Somerset Local Plan (Winter 2018)
- The City of Bath World Heritage Site Management Plan 2016-2022 (September 2016)
- Bath City-wide Character Appraisal (August 2005)
- Balancing your needs: A parking strategy for Bath and North East Somerset (July 2018)
- Bath and North East Somerset Climate Emergency Progress Report (October 2019)
- Bath and North East Somerset Air Quality Management Plans (various)

A.2.1 National Policies

A.2.1.1 The National Planning Policy Framework

A key objective identified within the National Planning Policy Framework (NPPF) is to promote sustainable transport, beside economic growth. *‘Transport issues should be considered from the earliest stages of plan-making and development proposals, so that the potential impacts of development on transport networks can be addressed’.*

The NPPF places a great emphasis on ‘place making’, thus achieving well-designed attractive places that are safe, inclusive, accessible and promote health and wellbeing.

The framework sets out detailed guidance under 17 subheadings that contribute to delivering sustainable development, of which the following are relevant to the development of this electric vehicle strategy.

- Ensuring the vitality of town centres;
- Promoting health and safe communities;
- Promoting sustainable transport;
- Achieving well-designed places
- Meeting the challenge of climate change, flooding and coastal change; and
- Conserving and enhancing the historic environment.

The NPPF identified that planning policies and decisions should ensure that land is used efficiently to ensure sustainable travel modes that limit future car use, the maintenance of an areas character and setting and the highlights the importance of well-designed, attractive and healthy places. The NPPF highlights that to ensure places are safe, secure and attractive conflicts between pedestrians, cyclists and vehicles should be minimised.

Parking guidance, under *promoting sustainable transport*, is provided in the NPPF. It stresses the importance of parking standards ensuring the adequate provision of spaces for charging plug-in and other ultra-low emission vehicles. The NPPF states *“‘If setting local parking standards for residential and non-residential development, policies should take into account ... the need to ensure an adequate provision of spaces for charging plug-in and other ultra-low emission vehicles.” and that “.....applications for development should ... be designed to enable charging of plug-in and other ultra-low emission vehicles in safe, accessible and convenient locations.”*

Implications for on-street EV charging in B&NES

Guidance in the NPPF establishes that adequate provision of spaces for charging plug-in and ultra-low emission vehicles should be made within new development. This supports a broader move towards increased provision on charging facilities, and overall supports appropriate and accessible provision of charging points.

A.2.1.2 Clean Air Strategy, 2019

This strategy, published by the Department for Environment Food & Rural Affairs, sets out the comprehensive action that is required from across all parts of government and society to meet emission reduction targets. The Clean Air Strategy, alongside the Industrial Strategy, the Clean Growth Strategy and the 25 Year Environment Plan, build upon consultation on emission reductions. The new legislation creates a stronger and more coherent framework for action to tackle air pollution which is underpinned by new England-wide powers enabling stricter control of major sources of air pollution.

Chapter 5 of the strategy details action to reduce emissions from transport and highlights *“transport is a significant source of emissions of air pollution. The immediate air quality challenge is to reduce emissions of nitrogen oxides in the areas where concentrations of these harmful gases currently exceed legal limits.”* Exceedance of nitrogen oxides, particularly in areas of living, working or playing, has a negative impact on human health. As such, through publishing ‘Road to Zero’ in 2018, the government set out a plan to end the sale of new conventional petrol and diesel cars and vans by 2040 to ensure the cleanest conventional vehicles are driven in the UK.

This Clean Air Strategy further supports the creation of Clean Air Zones (CAZ) which operate to lower emissions from all sources of air pollution, backed up with clear enforcement mechanisms. The CAZ framework details principles for local government to define an area where targeted action is to be taken to improve air quality. Resources are prioritised and coordinated to deliver improved health benefits and to support economic growth.

The Clean Air Strategy focuses on improving air quality predominately through reducing NOx and particulate matter. However, it acknowledges how there are opportunities for mitigating climate change and improving air quality together and encourages a move towards electric vehicles.

Implications for on-street EV charging in B&NES

The national Clean Air Strategy encourages the creation of Clean Air Zones to reduce air pollution in local areas. Through this, a CAZ is being introduced in Bath which will prompt vehicle upgrade and behaviour change. This policy aims to improve air quality and reduce vehicle emissions which will be supported through increasing EV charging infrastructure across B&NES.

A.2.1.3 The Road to Zero, 2018

The Road to Zero strategy, published by Department for Transport (DfT), outlines the UK's strategy and measures to promote cleaner road transport and lead in the design and manufacturing of zero emission vehicles. The strategy highlights that transport is the largest sector for UK greenhouse gas emissions (27%), of which road transport accounts for over 90% resulting in road transport is one of the biggest contributors to poor air quality in some of the UK's towns and cities.

Overarching aims of the strategy are to:

- Reduce the emissions from vehicles already on our roads;
- Encourage the uptake of the cleanest new vehicles;
- Reduce emissions from heavy goods vehicles (HGVs) and road freight;
- Place the UK at the forefront of the design and manufacturing of zero emission vehicles; and
- Support the development of one of the best electric vehicle infrastructure networks in the world.

Long term ambitions detailed in the Road to Zero include:

- Put the UK at the forefront of the design and manufacturing of zero emission vehicles;
- All new cars and vans should be effectively zero emission by 2040;
- End the sale of new conventional petrol and diesel cars and vans by 2040 and expect the majority of new cars and vans sold to be 100% zero emission and all new cars and vans to have significant zero emission capability;
- Almost every car and van should be zero emission by 2050; and
- At least 50%, and as many as 70%, of new car sales and up to 40% of new van sales being ultra-low emission by 2030.

It should be noted that in February 2020, Transport Secretary Grant Shapps stated that the date for ending the sale of conventional petrol and diesel cars could be moved forward to 2035 or 2032.

Implications for on-street EV charging in B&NES

The Road to Zero strategy supports a reduction in greenhouse gases, specifically through reducing vehicle emissions and prompting cleaner vehicles on UK roads. It aims to increase the development of zero emission vehicles in the UK through restricting the sales of conventional petrol and diesel cars by 2040. This will be supported and facilitated in B&NES by the development of an EV charging network.

A.2.1.4 The Clean Growth Strategy

The Clean Growth Strategy outlines the government strategy to reduce greenhouse gas emissions by at least 80% by 2050 (compared to 1990 levels). It notes the challenges and policies to deliver increased economic growth with decreased emissions.

One of the challenges listed is how transport related to 24% of UK emission (in 2015). Policies outlined to reduce the emissions include:

- End the sale of new conventional petrol and diesel cars and vans by 2040;
- Spend £1 billion supporting the take-up of ultra-low emission vehicles (ULEV), including helping consumers to overcome the upfront cost of an electric car;
- Develop one of the best electric vehicle charging networks in the world by:
 - Investing an additional £80 million, alongside £15 million from Highways England, to support charging infrastructure deployment; and
 - Taking new powers under the Automated and Electric Vehicles Bill, allowing the Government to set requirements for the provision of charging points.
- Work with industry as they develop an Automotive Sector Deal to accelerate the transition to zero emission vehicles;
- Announce plans for the public sector to lead the way in transitioning to zero emissions vehicles;
- Invest £1.2 billion to make cycling and walking the natural choice for shorter journeys; and
- Position the UK at the forefront of research, development and demonstration of Connected and Autonomous Vehicle technologies, including through the establishment of the Centre for Connected and Autonomous Vehicles and investment of over £250 million, matched by industry.

Implications for on-street EV charging in B&NES

The Clean Growth Strategy sets out the government approach for decarbonising the UK economy through the 2020s. One of the policies for reducing the transport emissions is to develop the electric vehicle charging network. This will be supported by the development of EV charging across B&NES.

A.2.1.5 Automated and Electric Vehicles Act

The Automated and Electric Vehicles Act was passed by the UK Government in July 2018 to provide legislative support for the uptake of Electric Vehicles.

The Act makes provision widespread EV charging facilities and aims to improve customer confidence in charging vehicles through ensuring that public charging points are compatible with all vehicles, standardising the payment at charging points and setting standards for reliability.

Implications for on-street EV charging in B&NES

The Act is intended to support the delivery of electric vehicles through powers to allow the Government to regulate public electric charging which standardises the compatibility, payment and reliability of charging points.

A.2.1.6 Decarbonising Transport, Setting the Challenge

The Department for Transport (DfT) set out the challenges facing the government's plan to accelerate the decarbonisation of transport ahead of the production of the Transport Decarbonisation Plan (TDP) anticipated in Autumn 2020. The TDP will take a coordinated, cross-modal approach to deliver the transport sector's contribution to both carbon budgets and net zero.

The six strategic priorities set out to guide the delivery of net zero transport system are:

- Accelerating modal shift to public and active transport;
- Decarbonisation of road vehicles;
- Decarbonising how we get our goods;
- Place-based solutions;
- UK as a hub for green transport technology and innovation; and
- Reducing carbon in a global economy.

EV on-street charging could directly support the priority to accelerate the decarbonisation of road vehicles. The document states: *“As we move to the mass adoption of ULEVs, more infrastructure will be needed alongside improvements to the consumer experience of using it. Whilst many EV drivers are likely to choose to charge their vehicles at home, or at their workplace, 20 to 30% of motorists do not have off-street parking. More than a third of households in England do not have access to off-street parking, and this proportion increases in urban areas where air quality concerns are most acute. Not everyone without off-street parking has a vehicle, but there are indications that around 25% of cars are parked on-street overnight.”* Through enabling the delivery of on-street EV infrastructure in B&NES, this can help support the delivery of the Decarbonising Transport report.

Implications for on-street EV charging in B&NES

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A.2.2 Local Policies

A.2.2.1 West of England Joint Local Transport Plan 2020-2036

The JLTP4 document has been developed to deliver the long-term aspiration for transport in the West of England, which has been encompassed in the transport vision for JLTP4: *“Connecting people and places for a vibrant, inclusive and carbon neutral West of England”*.

Five objectives have been identified, based on the aspirations of the West of England authorities and previous plans and policies prepared:

- Support sustainable and inclusive economic growth;
- Enable equality and improve accessibility;
- Address poor air quality and take action against climate change;
- Contribute to better health, wellbeing, safety and security; and
- Create better places.

The JLTP4 places large importance on the challenge of climate change identifying that, if no action is taken, CO2 emissions in the West of England will rise by 22% by 2036. Importance is therefore placed upon modal shift and encouraging greener modes of transport. It states that:

“By 2036 at the completion of the JLTP4 the West of England will be a carbon neutral community where walking and cycling are the preferred choice for shorter journeys, and the vast majority of vehicles on the road are decarbonised and no longer powered by fossil fuels”.

The JLTP4 follows on from the West of England’s Joint Transport Study (2017)⁸, which outlined a clear direction for the long-term development of the transport system in the West of England to 2036 and beyond linking to the delivery of the West of England’s Joint Spatial Plan (2017)⁹, which sets out policies and principles for determining the most appropriate and sustainable locations for future development to meet housing, employment and transport needs, up to 2036.

⁸ https://www.jointplanningwofe.org.uk/gf2.ti/-/757442/31727173.1/PDF/-/JTS_Final_Report.pdf

⁹ [https://www.bristol.ac.uk/media-library/sites/estates/documents/West_of_England_Joint_Spatial_Plan_Publication_Document_2017%20\(5\).pdf](https://www.bristol.ac.uk/media-library/sites/estates/documents/West_of_England_Joint_Spatial_Plan_Publication_Document_2017%20(5).pdf)

Economic development and housing growth are tied to growth in vehicle traffic. As part of JSP, B&NES was forecast to accommodate an additional 14,500 houses and the Bath City Riverside Enterprise Area, accommodating 9,000 new jobs, was identified. This scale of economic development will not only increase traffic on the highway network but will also increase the number of people likely to be subjected to any ongoing air quality issues in Bath. Transport is widely acknowledged as a key driver of air quality issues, with highway traffic problems such as congestion and fleet composition considered as a primary source of air pollution. The West of England JSP in its current form as a regional spatial strategy, is no longer being progressed and is not adopted policy. However, the growth and development considerations are to be progressed as part of each constituent authorities' local planning strategies and policies.

Section 5 of the JLTLP4 draws attention to the aims to improve connectivity across the region. Within this, it is noted that, *"in seeking to reduce the level of emissions, including carbon, we will provide infrastructure to support the use of electric vehicles"*.

Section 7 of the document identified improvements to connectivity within the West of England. It states how parking controls can be beneficial in encouraging modal shift and as such reducing carbon emissions and air quality. It states that:

"The potential for emerging technology in improving car park and kerb management will be considered through, for example, the reservation of on-street parking spaces (including EV charging points)."

Section 8 of the JLTLP4 highlights the ambitions for local connectivity which will be used to inform the development of the EV strategy. The policies in the JLTLP4 to enhance local connectivity are:

- **Support work on zero and low emission vehicles**

This will be supported through identifying and addressing any barriers to the uptake of ULEVs, especially in areas declared as AQMAs or CAZs. Additionally, work will be undertaken to introduce policy supporting EV uptake, promote ULEVs to run on renewable energy, change parking standards to require new developments to provide greater levels of charging infrastructure.

- **Support necessary infrastructure to encourage ULEVs**

This will include the development of a regional electric vehicle charging network and 4 rapid charging hubs at locations across the region allowing owners to charge their vehicles in 30 minutes or less.

- **Support opportunities for all sectors of the population to access the services they require, wherever they live; and**

This will be supported through supporting technology in accessing services and employment and support taxis, private hire and demand responsive community transport. Support for those without a private car can access the services that they require.

- **Support the identification and implementation of measures that will improve air quality.**

Air quality improvements will be supported through managing the impact of transport on air quality and climate change, Clean Air Zones and the UK Air Quality Plan and through support for work on Zero and Low Emission Vehicles.

Implications for on-street EV charging in B&NES

The JLTLP4 sets out the transport aspirations for the West of England up to 2036 including aims to support the development and uptake of ULEVs. The implementation of an EV strategy in B&NES is key to enable and drive the shift to electric vehicles, therefore helping to deliver the reduce carbon emissions and improve air quality. It should be noted that the B&NES EV strategy should align with the improvements outlined within the JLTLP4 and be delivered alongside these.

A.2.2.2 West of England Ultra-Low Emission Vehicle Policy Statement 2020-2023 (emerging)

The West of England authorities are currently working together to develop a policy statement on Ultra-Low Emission Vehicles. This will acknowledge the climate crisis and the requirement for a rapid switch to carbon neutral transport. As such, the document will outline the steps to be undertaken to accelerate the shift to zero emission vehicles. The objectives will be centred around shifting to ULEV vehicles and include support for the roll out of charging points. This policy statement remains in development.

Implications for on-street EV charging in B&NES

The emerging ULEV strategy will encourage and support a shift to carbon neutral transport across the West of England through various objectives including increasing electric charging points. The development of a strategy for the delivery of on-street charging points in B&NES will be in line with the West of England's overall approach to ULEVs.

A.2.2.3 Bath and North East Somerset Draft Corporate Strategy 2020 -2024

The Corporate Strategy sets out the Council's overarching strategic plan. It was published in draft in December 2019 for engagement which will closed at the end of January 2020. The Strategy identifies the framework, challenges and core policies for the next four years.

The two core policies set out in the draft Corporate Strategy are: Tackling the climate and nature emergency and Giving people a bigger say. Three priority areas have been identified in the Corporate Strategy to help to tackle the climate and nature emergency:

- Energy efficiency improvements to existing buildings and zero carbon for new build;
- A major shift to mass transport, walking and cycling to reduce transport emissions; and
- A rapid and large-scale increase in local renewable energy generation.

One of the key commitments stated in the draft Corporate Strategy, and of relevance the EV strategy, is to "Introduce 'on-street EV charging' working with schools and local communities".

Implications for on-street EV charging in B&NES

The Corporate Strategy sets out the overarching strategic plan for the Council which including a reduction in transport emissions. It details the key commitment to introduce on-street EV charging working with schools and local communities which this development of this policy on EV charging directly supports.

A.2.2.4 The Getting Around Bath Transport Strategy

The Getting Around Bath Transport Strategy sets out the transport ambitions covering the period up to 2029. It highlights the vision for the city: *"Bath will enhance its unique status by adopting measures that promote sustainable transport and reduce the intrusion of vehicles, particularly in the historic core. This will enable more economic activity and growth, while enhancing its special character and environment and improving the quality of life for local people"*.

This strategy identifies the reduction of the impact of vehicles through encouraging sustainable transport as the key overarching aim. It establishes the following objectives:

- Supporting and enabling economic growth, competitiveness and jobs;
- Improving air quality and health, reducing vehicle carbon emissions;
- Promoting sustainable mobility;
- Widening travel choice;
- Widening access to opportunities: jobs/learning/training;
- Safeguarding and enhancing the unique historic environment and World Heritage Site status; and
- Improving the quality of life in the city.

Fifteen policies have been identified in the strategy to help deliver the vision and objectives. Those that are relevant to the EV strategy are listed below.

Policy GABP1: Reduce the impact of vehicles

“That a strong emphasis should be given to reducing the impact of vehicles by supporting trips that are made by means other than car, particularly walking and cycling with more people using improved bus and rail networks.”

A key strand of the Strategy is to reduce the impact of vehicle movements through a combination of measures including better traffic management, comprehensive parking controls, expansion of park and ride and enabling people to walk, cycle and use trains and buses. All these contribute to reducing in car journeys and addressing the problems manifest in the Air Quality Management Area.

Parking in particular is a key issue and progressive reductions in the supply of public on- and off-street parking to support a shift to the provision of long stay parking at Park and Ride sites have been implemented in recent years.

Policy GABP4 - Reduce vehicle emissions

“Vehicle movement should be better managed to reduce traffic impact and emissions, particularly in the city centre where there is less space available.”

Additional parking in the core of the city unrealistic since space is scarce, and additional traffic would be undesirable. Instead, parking within walking distance of all the main destinations should be available.

Measures to restrict traffic can be highly effective. Such measures need to be considered in the wider context to understand the implications for other parts of the city.

Policy GABP4 notes through-traffic to be a problem. This includes traffic with both an origin and destination outside the city which has no purpose in Bath and should use other routes. Measures will include:

- Development of a city centre traffic management plan;
- Setting principles
 - Removing gyratories;
 - Removing traffic signals where possible; and
 - Creating shared spaces.
- Addressing strategic and local ‘through-traffic’ (around 12% of volume) especially heavy vehicle enforcement; and
- Traffic management related to development sites e.g. Enterprise Area.

Policy GABP7: Appropriately reduce parking central parking provision

“Car parking is a central feature of the strategy, enabling other components to take effect. The policy of reducing central area public parking and expanding long stay capacity at Park and Ride sites should continue, enabling greater emphasis to be given to walking, cycling and bus services in the historic core and on key corridors. Reduction of city centre parking will not take place until alternatives are in place.”

An objective of the B&NES wider parking strategy is to effectively manage the transport impact and total parking supply. Whilst no policies in the strategy refer to electric vehicles, the document highlights that in consultation 74% of respondents supported proposals to increase facilities for electric vehicles within the city centre.

Implications for on-street EV charging in B&NES

The Getting Around Bath Transport Strategy outlines the aims and objectives for transport within Bath. It outlines the support of residents during consultation for electric vehicle facilities within the city centre. The development of an on-street EV policy will support the consultation comments and policies within the Strategy for reductions in carbon emissions.

A.2.2.5 Existing B&NES Local Plan (Core Strategy and Placemaking Plan)

The existing B&NES local plan comprises of the Core Strategy (CS) and the Placemaking Plan (PMP).

The Core Strategy (July 2014)

Adopted in 2014 (updated in 2017 with the introduction of the Placemaking Plan), the Core Strategy is a key policy document for B&NES that puts in place a strategic planning framework to guide change and development in the District over the following 20 years and beyond.

Strategic objectives include:

- Pursue a low carbon and sustainable future in a changing climate;
- Protect and enhance the District's natural, built and cultural assets and provide green infrastructure;
- Encourage economic development, diversification and prosperity;
- Invest in our city, town and local centres;
- Meet housing needs;
- Plan for development that promotes health and wellbeing; and
- Deliver well connected places accessible by sustainable means of transport.

In conjunction with the JLTP4, the Local Plan will deliver this by:

- Locating and designing new development in a way that reduces the need and desire to travel by car and encourages the use of public transport, walking and cycling;
- Ensuring that development is supported by high quality transport infrastructure which helps to increase the attractiveness of public transport, walking and cycling; and
- Promoting improved access to services especially for rural and more remote areas.

The Placemaking Plan (July 2017)

The Placemaking Plan complements the Core Strategy and covers detailed development management and design principles for allocated sites within the Authority. Moreover, it entails a range of policies for the management and protection of valued assets throughout Bath and North East Somerset.

The document focuses on each of the Authority's local areas separately.

For Bath, the plan states that it is vital to reduce the impact of vehicles, as it is a unique UNESCO World Heritage city. Achieving this successfully will require a combination of measures, including a parking strategy, continued expansion of the existing Park and Ride sites and finding a new solution for coach parking.

For Keynsham, one of the main reasons for local residents not visiting the town centre was difficulty in parking. Additionally, limited car parking capacity in the town centre is presented as one of the risks with the current spatial strategy.

For Somer Valley, the plan states that the accessible parking in Midsomer Norton Town Centre is an asset, but that the dominance of parking in the street scene could hinder a successful implementation of the spatial strategy. Making improvements in car parking provision would help to reinforce this area as an accessible town centre arrival point. Together with improved pedestrian connections this could stimulate greater movement to and from the High Street and make more use of the park and leisure facilities.

Implications for on-street EV charging in B&NES

The local plan details the vision for development across B&NES. The Core Strategy outlines the objectives which includes a sustainable, low carbon future which will be supported through the development of EV charging.

A.2.2.6 The Emerging B&NES Local Plan

The Emerging Local Plan has been prepared alongside the (now withdrawn) West of England Joint Spatial Plan (JSP). The Emerging Local Plan will include a strategy to guide development, site allocations (including strategic development locations and smaller sites) to meet development requirements and district-wide Development Management policies for determining planning applications. Consultation on the Local Plan Options document took place in November 2018 until January 2019 on the Emerging Local Plan. Comments from the consultation are being analysed ahead of the publication of the Draft Local Plan.

The emerging core strategy sets out the councils' values and priorities:

- Protect and care for our most vulnerable;
- Nurture residents' health, safety and wellbeing; and
- Provide ways for everyone in the community to reach their full potential.

The Local Plan Options document details that the values should be considered when reading the Spatial Priorities:

- Pursue a low carbon and sustainable future in a changing climate;
- Protect and enhance the District's natural, built and cultural environment and provide green infrastructure;
- Facilitate a strong, productive, diverse and inclusive;
- Meet housing needs arising from a changing and growing population;
- Plan for development that promotes health and well-being;
- Deliver well connected places accessible by sustainable means of transport; and
- Ensure the timely and efficient provision of infrastructure to support growing communities.

For B&NES, the withdrawn JSP proposed a requirement to plan for 14,500 new dwellings by 2036 which is an additional 4,700 houses than set out in the existing committed sites. The local plan, when adopted will have the role of establishing how the "non-strategic" growth of 700 dwellings can be accommodated within B&NES and as such, the report sets out two options for this.

In terms of transport, the options study sets out the changes since 2011. Policies proposed to tackle the challenges outlined in the document include DM1 which outlines the approach for carbon reduction. This includes aims to use less energy, use clean energy and offset what can't be mitigated on site.

DM16 outlines the policy approach for electric vehicle infrastructure with the overarching principle that all development proposals will be required to integrate the provision of infrastructure into the design and layout of the development to enable the charging of electric or other Ultra-Low Emission vehicles.

Implications for on-street EV charging in B&NES

The Emerging Local Plan sets out the future aspirations for development across B&NES. The Plan is supportive of reducing carbon emissions and providing electric vehicle infrastructure. It supports electric vehicle infrastructure through new developments.

A.2.2.7 The City of Bath World Heritage Site Management Plan

The City of Bath World Heritage Site Management Plan (2016-2022) was presented to Bath and North East Somerset Council's Full Council meeting on 15 September 2016. The Council endorsed the plan for submission to the Department for Culture, Media and Sport (DCMS) and in turn to UNESCO.

The City of Bath has been a World Heritage Site (WHS) since 1987, recognised as a place of Outstanding Universal Value (OUV) for its architecture, town-planning, landscape, archaeological remains and its role as a setting for social history.

The plan priorities are:

- Managing Development;
- Transport;
- Public Realm;
- Interpretation and Education; and
- Environmental Resilience.

In terms of transport, the plan states that the congestion poses a major issue for the World Heritage Site (WHS) having detrimental impacts on air quality, residents and businesses. The plan sets out the following objectives and actions relating to transport:

- Objective 3: Work to control traffic growth and harm, and encourage and promote less car use, especially in the city centre.
- Action 5: Engage with and monitor the delivery of the Transport Strategy (2014) objectives & seek to ensure that they deliver maximum benefit & no unacceptable impact to the OUV of the WHS & its setting.
- Objective 4: Ensure that other national and regional bodies take full account of the WHS in their strategic planning.
- Action 6: Engage with central government & neighbouring authorities as necessary to reduce the impact of major road traffic routes passing through the WHS.
- Objective 5: Ensure that new street works, and other developments are completed to high and consistent design standards allowing good accessibility to all.
- Action 8: Continue to implement public realm improvements, especially with regard to poor pavement surfaces.
- Action 9: Ensure that the Bath Pattern Book is adhered to & updated as necessary to guide street works in the WHS.
- Action 10: Continue to reduce the impact of vehicular traffic & continue the closure of key streets within the site to vehicles where there is a valid case for doing so.
- Action 17: Install welcome signs on road, rail, river, canal & walking entrance points & seek to improve way marking for heritage walking routes.
- Action 26: Support actions to reduce air pollution, primarily caused by petrol/diesel powered vehicles, which is a direct risk to people & historic fabric within the WHS.

Implications for on-street EV charging in B&NES

The World Heritage Site Management Plan identifies traffic as a major issue for the WHS and aims to promote less car use and improve air quality. EV charging points implementation should consider the distinct nature of the WHS to ensure appropriate installation for the streetscape.

A.2.2.8 Bath City-wide Character Appraisal

The Bath City-wide Character Appraisal was carried out in 2004 – 2005 to help develop the understanding of the character of the city. It was adopted as a Supplementary Planning Document in 2005. The aims of the document are:

“By identifying key elements of character and highlighting variations across the city this document will help to retain, conserve, maintain and enhance Bath’s character and quality through the development control process and by informing other projects such as public realm enhancements.”

The document identifies 22 character areas which consider the physical influences, land use and buildings, streets and civic spaces, vegetation and open space, features, landmarks and views and cultural influences.

Implications for on-street EV charging in B&NES

The document outlines the 22 character areas recognising the World Heritage Site, Hot Springs, Conservation Areas, Green Belt, Areas of Outstanding Natural Beauty, Listed Buildings, Ancient Monuments and historic landscapes. Consideration of these areas is required in the implementation of EV charging infrastructure to establish suitable locations, materials and design.

A.2.2.9 Balancing Your Needs: A parking strategy for Bath and North East Somerset

The parking strategy was developed in line with the policies in the Placemaking Plan and the current and emerging B&NES transport strategies which have been developed for a number of towns and areas within the authority. In particular, the parking strategy supports the need to reduce the level of intrusion of vehicles into urban centres, reflecting concerns about the impact of traffic congestion on the environment and air quality, as well as the need to protect the historic fabric of the World Heritage Site (WHS) in Bath.

The principles of the parking strategy are:

- To sustain and enhance the vitality and viability of settlements within Bath and North East Somerset, including the City of Bath, through parking policies which support the prosperity of the city and towns whilst reducing traffic in the most congested areas and improving the air quality;
- To effectively manage the total parking supply, which includes all types of parking, and consider priorities, regulation, charges and enforcement; and
- To manage travel demand in new developments by introducing restraint-based car parking standards, to avoid the over provision of car parking spaces, whilst meeting the needs of essential users.

The strategy outlines that on street parking is in high demand, particularly in the centres of Bath and Keynsham. To ensure best use of the kerb space the parking strategy includes a hierarchy of kerb space which prioritises alternatives to private car trips, maintains accessibility for disabled users and supports the operation of businesses. Within Bath controlled parking zones are used to manage street parking demand.

Off street public parking have high occupancy levels, particularly in Bath and the strategy states that over time, long stay off street parking will be reduced in favour of short stay parking and Park and Ride facilities which are growing in popularity. Private car parks in Bath also have high occupancy levels and the strategy notes that changes to these will have significant impacts to travel patterns.

The strategy states that a reduction of prescribed parking standards may be justified in areas with high connectivity and good public transport provision and that the ‘Bath and North East Somerset Council’s Development Accessibility Assessment’ assesses a site’s level of connectivity before proposing a reduction from the standards.

The main parking objectives and action points, of relevance to this strategy, are summarised in Table A-1. Objective PSO25 is particularly relevant to the EV strategy as it states support for an increase in the number of electric vehicle charging points on street and within car parks.

Table A-7-1: Types of interventions and measures that could be used to support on-street EV charging

Theme	Objective
Parking Standards	<p>PSO1 Encourage and facilitate the provision of car club bays within new developments to reduce car ownership and pressures on residential parking within Bath</p> <p>PSO2 Developments within Bath and North East Somerset should provide provision for electric vehicle charging points in accordance with the following standards:</p> <p>Residential developments with shared car parks – active provision for 20% spaces and passive provision for 20% spaces</p> <p>Residential developments with individual parking – passive provision within each property</p> <p>Commercial developments – active provision in 5% car parking spaces</p>
Managing On-Street Parking	<p>PSO6 Where it is deemed safe, on-street parking will be allocated using a balance approach to meet the demands in accordance with the Hierarchy of Kerb Space. Parking restrictions will be introduced, or parking prevented altogether, in order to reduce traffic and to maintain free flow of the highway network.</p> <p>PSO7 Within the centre of Bath priority for on-street parking will be given to disabled users, then residents parking zones and then short stay parking (maximum 2 hours) at the expense of long stay parking.</p> <p>PSO8 Additional Residents Parking Zones in all areas of Bath and North East Somerset will only be introduced in accordance with the 'Purpose of Residents Parking Schemes' where it can be demonstrated that the criteria outlined in 'Guidance to the Introduction of Residents Parking Schemes' has been met and the scheme has the support of local members.</p> <p>PSA 1 The Council should consider undertaking a strategic review of the existing residents parking scheme zoning system to determine whether an alternative zoning structure would result in more efficient use of on-street spaces.</p> <p>PSA 2 The Council will consider altering the hours of operation of residents parking zones, where sufficient evidence can be provided to demonstrate support for a change amongst residents and local members in line with criteria outlined in 'Guidance to the Introduction of Residents Parking Schemes'.</p> <p>PSA 3 The Council should undertake a review of the available permit types and remove those that do not comply with the objectives and policies of this strategy.</p> <p>PSO9 Allocation of permits to new developments, and existing properties with a new use, will be in accordance with the policy set out in E2911. In particular, permits will not be allocated in zones where the potential demand of existing properties exceeds the available capacity.</p> <p>PSA 4 Surveys undertaken in March 2015 and November 2016 suggest there is currently residual capacity on-street in Keynsham. The Council will undertake periodic reviews of on-street parking demand in Keynsham to monitor whether intervention is required.</p> <p>PSA 5 Recent evidence suggests that there is available capacity on-street in the Somer Valley. The Council will undertake periodic reviews of on-street parking demand in the Somer Valley to monitor whether intervention is required.</p> <p>PSA 6 Issues related to a lack of passing places caused by on-street parking will be considered by the Council on a case by case basis, with the aim of minimising safety problems.</p>
Multi Modal Parking	<p>PSA 14 Establish an expert panel on disability issues to guide policy decisions.</p> <p>PSO23 Ensure adequate parking is provided in suitable locations for disabled users and enforce the proper use of it. Undertake a review of access routes between off-street disabled parking and the city centre, particularly where changes to provision and/or location are implemented, to ensure that the existing level of provision is maintained or improved.</p> <p>PSO24 Continue to encourage the provision of car clubs in central Bath.</p> <p>PSO25 Support an increase in the number of electric vehicle charging points on street and within car parks.</p> <p>PSO26 Improve the provision of high-quality dedicated motorcycle parking spaces on street and in Council operated off-street car parks.</p> <p>PSA 15 Work with operators and stakeholders to increase the provision, maintenance and desirability of on-street cycle parking spaces at retail and leisure facilities.</p> <p>PSA 16 Work with operators and stakeholders to increase the provision, maintenance and desirability of high quality covered cycle parking spaces at Bath train station.</p> <p>PSO27 Provide adequate parking and drop off/pick up facilities for coaches in Bath in accordance with the Coach Strategy.</p>

Theme	Objective
	<p>PSO28 Continue to support the operation of taxis in Bath and North East Somerset through provision of adequate and suitable located taxi ranks, and consider appropriate locations for electric charging points. This should be periodically reviewed to respond to changes in travel patterns resulting from alternative taxi services.</p>
	<p>PSO29 Ensure suitable provision of unloading/loading space to support local businesses and operations</p>
	<p>PSO30 Hours of access for servicing and delivery vehicles in the centres of Bath and Keynsham will be restricted if required to support the delivery of public realm improvements, including aspirations within the Public Realm Movement Strategy.</p>
Information and Enforcement	<p>PSO31 Parking enforcement should facilitate protection of road space in order to maintain free flow of traffic in the network, ensure off-street parking is used as intended and encourage education of motorists to avoid penalties and ensure the protection of pedestrian safety.</p>

Implications for on-street EV charging in B&NES

The Parking Strategy supports electric vehicle provision with support for an increase in the number of electric vehicle charging points on-street and within car parks. This strategy will build on the policy commitment through delivering a framework for on-street EV charging.

A.2.2.10 B&NES Climate Emergency Progress Report

In March 2019 B&NES declared a Climate Emergency¹⁰ committing the Council to provide leadership enabling the local authority to achieve carbon neutrality by 2030. The resolution included that the Council recognises “*the need to enable low carbon living across society through changes to laws, taxation, infrastructure plus transport in all forms, policies and plans*”.

The Climate Emergency promoted the development of the Climate Emergency Outline Plan to be presented to Council in October 2019. The recommendations put to B&NES within the report include 3 immediate priorities:

- Energy efficiency improvement of the majority of existing buildings (domestic and non-domestic) and zero carbon new build;
- A major shift to mass transport, walking and cycling to reduce transport emissions; and
- A rapid and large-scale increase in local renewable energy generation.

With regards to transport, the proposed targets are:

- 25% reduction in car use km per person per year;
- Modal shift creates 7% reduction in car travel;
- Passenger kms travelled to comprise Electric cars: 76% pure battery EV, 14% Petrol Hybrid EV; and
- 76% electric buses, 24% hybrid buses.

The Council will lead the establishment of a new district-wide partnership, named the B&NES Climate Emergency, Environment and Place Partnership. This will encompass work from relevant existing local and West of England partnerships, strategies and projects.

Implications for on-street EV charging in B&NES

The Climate Emergency report details B&NES’ commitment to carbon neutrality by 2030 which includes aims to increase electric vehicle uptake across B&NES. The EV strategy will help to enable the shift to electric vehicles as set out in the on-road transport targets.

A.2.2.11 B&NES air quality management plans

¹⁰ <https://democracy.bathnes.gov.uk/documents/g5196/Public%20minutes%2014th-Mar-2019%2018.30%20Council.pdf?T=11>

B&NES has five designated air quality management areas (AQMA), where levels of nitrogen dioxide exceed the national annual average objective of 40 micrograms per cubic metre ($\mu\text{g}/\text{m}^3$). The AQMAs are located in: Bath, Keynsham, Saltford, Farrington Gurney and Temple Cloud.

Bath Clean Air Zone

The full business case¹¹ has been developed for Bath's Clean Air Plan, which is scheduled for approval by Bath's Cabinet in January 2020. It outlines preferred option proposals including a Class C Clean Air Zone (CAZ), assumptions regarding bus replacement/retrofitting, a traffic management scheme at Queen Square and a package of non-charging measures.

The Plan proposals look to deliver widespread behaviour change, such as: accelerated vehicle upgrading, switch in preference for vehicles by fuel type, reduction in non-compliant vehicle fleet, increased mode share of public transport, increased mode share of active travel modes, diverted/cancelled trips, changes to use of highway network across B&NES. These changes look to deliver impacts including improved air quality, increased physical activity, improved human health and making Bath a cleaner more attractive place to live, work and visit.

Implications for on-street EV charging in B&NES

The Clean Air Plan is anticipated to increase the uptake of electric vehicles within Bath which has informed the development of the EV on-street charging policy – particularly future fleet composition assumptions and consideration of infrastructure provision. An EV strategy would help to enable the shift to electric vehicles as set out in the on-road transport targets.

A.2.2.12 Air Quality Action Plans for Keynsham and Saltford

The air quality action plans for Keynsham and Saltford outline actions that Bath & North East Somerset Council recommend are delivered in Keynsham and Saltford between 2016-2021 in order to reduce concentrations of air pollutants and exposure to air pollution. These include the following measures relevant to this strategy:

- Changes to traffic management;
- Information campaigns;
- Increase in public and private electric vehicle charging infrastructure;
- Pedestrian and cycling facility improvements, including cycle parking and cycle routes;
- Exploration of “electric zones”; and
- Influence development designs to improved access to public transport, cycling and walking routes, including prioritisation and lighting.

Implications for on-street EV charging in B&NES

It is estimated that electric vehicle ownership will increase across Keynsham and Saltford as a result of the plan. The electric vehicle on-street charging policies and consideration of infrastructure provision as part of this Strategy document will take account of these air quality action plans.

A.3 Legislation and guidance that can be used to implement on-street EV charging or should be considered in their implementation

The following legislation gives B&NES the powers required to implement on-street EV charging:

- The Road Traffic Regulation Act 1984; and
- The Traffic Management Act 2004.

A.3.1 The Road Traffic Regulation Act 1984

¹¹ https://www.bathnes.gov.uk/sites/default/files/siteimages/Environment/Pollution/674726.br_042.fbc_-_bath_clean_air_plan_fbc_draft.pdf

The Road Traffic Regulation Act 1984 provides powers to regulate or restrict traffic on UK roads, in the interest of safety. The Act contains sections on parking places and enforcement, which are relevant to the implementation and management of on-street EV charging spaces.

The Act enables the local authority to make Traffic Regulation Orders (TROs) which can limit or prohibit parking. They could be used, for example, to limit parking to permit holders or to enforce length of stay. TROs have a legal requirement for consultation and implementation must follow the statutory process.

TROs can be permanent or temporary. Temporary orders have a maximum time limit of 18 months. The procedure for making permanent or temporary orders varies. For permanent orders the procedure is:

- **Preliminary requirements:** Consultation with bodies specified in Regulation 6, such as the emergency services and other public bodies must take place. Other interest groups such as local residents and traders may be consulted where appropriate. The TRO must also be advertised in the local press and usually on local display notices around the roads affected for at least 21 days.
- **Public objections and inquiries:** Anyone can object in writing to an order by the date specified on the notices or if later within 21 days of the notice being given and publicity being adequate. A public inquiry may be held in certain circumstances if it affects loading and unloading times or bus services.
- **Consent for certain schemes:** The Secretary of State's consent is required where a scheme affects a road for which (s)he is the traffic authority; where a scheme will restrict access to property for 8/24 hours.
- **Making an order:** Orders cannot be made before the statutory period for objections has ended or after a period of two years from the making of the initial notice. Within 14 days of making the order the authority must place a notice in the local press announcing their decision.

In contrast to TROs, Experimental Traffic Orders (ETOs) may be implemented without consultation / publicity and feedback on the order is then gathered. The Roads: Traffic Regulation Orders 2014 House of Commons Research Briefing Paper¹² states *"This can be a more cost effective and flexible approach (allowing e.g. for immediate feedback and minor changes) than a permanent order or a temporary order"*.

Implications for on-street EV charging in B&NES

Should B&NES wish to implement on-street electric vehicle charging points which can only be used by electric vehicles, for a time limited period, this should be implemented through a TRO and the process, as set out in the Act, followed.

A.3.2 The Traffic Management Act 2004

The Traffic Management Act 2004 gives powers to reduce traffic congestion in towns and cities and reduce disruption on the road network. All parties interested in occupying the highway need to follow specific guidelines. The Act outlines that it is the duty of the local traffic authorities to secure the movement of traffic on the authority's road network and any action they consider secures:

- The more efficient use of their road network; or
- The avoidance, elimination or reduction of road congestion or other disruption.

The Act ensures effective communication between highway authorities and parties interested in carrying out street works. Powers are given to highway authorities to impose fixed charges in case of any failure to follow the guidelines. The Act (part 6) also gives tools to local authorities to manage parking policies and enforce some traffic moving offences.

The Secretary of State's Statutory Guidance to Local Authorities on the Civil Enforcement of Parking Contraventions, published under the Traffic Management Act, sets out the policy framework for Civil Parking Enforcements. This sets out that enforcement authorities should design their parking policies with particular regard to:

¹² <https://commonslibrary.parliament.uk/research-briefings/sn06013/>

- *Managing the traffic network to ensure expeditious movement of traffic, (including pedestrians and cyclists), as required under the Traffic Management Act 2004 Network Management Duty*
- *Improving road safety;*
- *Improving the local environment;*
- *Improving the quality and accessibility of public transport;*
- *Meeting the needs of people with disabilities, some of whom will be unable to use public transport and depend entirely on the use of a car; and*
- *Managing and reconciling the competing demands for kerb space.*

Implications for on-street EV charging in B&NES

The Guidance also highlights how the enforcement authorities should adopt the lowest penalty charge level consistent with a high level of public acceptability and compliance. London Boroughs have used this guidance for enforcement of electric charging spaces only being utilised for charging electric vehicles.


A.3.3 Manual for Streets & Manual for Streets 2 guidance

A.3.3.1 Manual for Streets

Although not policy, Manual for Streets (MfS) changed the approach to the design, construction, adoption and maintenance of urban streets. It provided a revised ‘movement framework’, which changed the focus from heavy engineering influenced design standards, to considering connectivity and flow of movement.

“Street networks should, in general, be connected. Connected, ‘permeable’ networks encourage walking and cycling, and make places easier to navigate through.”

In MfS, policies are aimed at making car use a matter of choice rather than a habit or dependence. Whilst the movement framework is recommended for a new development be based on user hierarchy, the principles are just as relevant when considering existing infrastructure and changes to road-space allocation or prioritisation of modes. Ultimately, applying the hierarchy will lead to a design change that increases the attractiveness of walking, cycling and the use of public transport.

Consider first  Consider last	Pedestrians
	Cyclists
	Public transport users
	Specialist service vehicles (e.g. emergency services, waste, etc.)
	Other motor traffic

MfS encourages a reduction in the need to travel by car through the promotion of mixed-use neighbourhoods with interconnected street patterns, where daily needs are within walking distance of most residents, named the ‘walkable neighbourhood’. For increased pedestrian movement, Manual for Streets advises:

- The propensity to walk is influenced not only by distance, but also the quality of the walking experience;
- Pedestrian networks need to be connected. Where routes are separated by heavily-trafficked routes, appropriate surface-level crossings should be provided;
- Pedestrians should generally be accommodated on multifunctional streets rather than on routes segregated from motor traffic. In situations where it is appropriate to provide traffic-free route they should be short, well-overlooked and relatively wide;
- Obstructions on the footway should be minimised; and
- There is no maximum width for footways, widths should take account of pedestrian volumes and composition.

A.3.3.2 Manual for Streets 2

Manual for Streets 2 (MfS2) echoes key principles from the first addition, including:

- Application of a user hierarchy – pedestrians are at the top. Thus, the needs of pedestrians are considered first when designing, building, retrofitting, maintaining and improving streets;

- Recognising the importance of the community function – streets to be considered as spaces for social interaction. Streets to integrate and not segregate communities and neighbourhoods;
- Promoting an inclusive environment – design that recognises the needs of people of all ages and abilities. Designs must recognise the importance of way-finding and legibility;
- Reflecting and supporting pedestrian and cyclist desire lines;
- A locally appropriate balance should be struck between the needs of different user groups – traffic capacity to not always be primary consideration in street design;
- Encouraging innovation – a flexible approach to street layout; and
- Designing to keep vehicle speed at or below 20 mph – in particular, where there is significant pedestrian movement.

The Manual for Streets 2 document acknowledges the benefits of reducing reliance on motorised vehicles and opening upon spaces for shared purposes. Notably, *“making appropriate provision for road-based public transport, cycling and walking can help encourage modal shift from the private car, and so contribute to the sustainability and health agendas”*.

Enhancing street environments through removal of clutter, use of shared space and enhanced street lighting can help stimulate local economic activity, reduce street crime and encourage a sense of local community. This in turn encourages more local, shorter distance travel on foot or by cycle. Ultimately conforming to MfS first principle of user hierarchies.

Shared space is predominantly an approach to highway design and can be introduced for a range of purposes including:

- Improving the built environment;
- Giving people freedom of movement rather than instruction and control;
- Improving the ambience of places;
- Enhancing social capital;
- Enhancing the economic vitality of places; and
- Safety.

A shared space is defined as a street or place accessible to both pedestrians and vehicles that is designed to enable pedestrians to move freely by reducing traffic management features that tend to encourage users of vehicles to assume priority.

Implications for on-street EV charging in B&NES

The key principles detailed in Manual for Streets and Manual for Streets 2 should be applied to the implementation of EV charging infrastructure to ensure that consideration of pedestrians / cyclists and public transport users are prioritised therefore ensuring that space for these users is not inappropriately restricted by EV charging infrastructure.

A.3.4 Guidance for on-street residential grant scheme

Although not policy, this recently updated guidance document (May 2020)¹³ invites local authorities to submit applications for the on-street residential grant scheme. The scheme aims to increase on-street charging points in residential streets where no off-street parking is available, to ensure this does not act as a barrier to the realisation of the benefits of plug-in electric vehicle ownership. The scheme will be administered by the Energy Savings Trust on behalf of Office for Low Emission Vehicles (OLEV).

£20m of funding for 2020/21 has been allocated by OLEV to fund these on-street residential projects. Subject to applications meeting minimum technical specifications, local authorities can apply for grants to fund 75% of the capital costs required to procure and install on-street EV charging infrastructure, including associated dedicated parking bays, to

¹³ <https://www.gov.uk/government/publications/grants-for-local-authorities-to-provide-residential-on-street-chargepoints/grants-to-provide-residential-on-street-chargepoints-for-plug-in-electric-vehicles-guidance-for-local-authorities>

meet residential needs. The guidance suggests applications will vary but not be greater than £6,500 per charge point, although applications greater than £6,500 but no more than £7,500 will be considered on a case-by-case basis. Local authority applications would not amount to more than £100k per project.

Implications for on-street EV charging in B&NES

The availability of this funding could enable B&NES to increase on-street charging infrastructure within the local authority, in areas that need it most with reduced financial burden.

Appendix B. EV charging case studies

Waltham Forest

Waltham Forest has produced an Electric Vehicle (EV) Charging Point Strategy for 2018 – 2022. It proposes varied types of charging infrastructure, operating at different speeds, for a range of needs.

Lamp post charging points

A lamp post can be used to accommodate a 3kW charging point in a residential area, which is the location in which most charging occurs. Fully charging at 3kW generally takes 7 to 8 hours, which allows for charging overnight. Lamp post charging addresses the challenge of charging vehicles when owners do not have access to off-street parking.

Lamp post chargers tap into the existing power network created for street lighting and are either integrated into the lamp post itself or attached to it. This makes them less expensive than alternative floor mounted units and they do not add to street clutter, assuming existing lamp posts are present. They are limited to 3kW as they are linked to the existing power grid. Lamp post chargers are most suited to when the existing lamp posts are situated at the front edge of the pavement. If they are situated towards the back of the pavement, and trailing cables would therefore introduce a trip hazard, a bollard sized floor mount with the connectors for charging could be placed at the front of the pavement with the power drawn from the lamp post using underground cables. This would, however, add to street clutter.



The optimal use of lamp posts as charging points requires multiple numbers of them on each street and appropriately spaced out to ensure residents are always able to access a charging point. A Traffic Regulation Order (TRO) may be needed to ensure the spaces next to lamp post charging points are kept free from non-electric vehicles. In order to be suitable for use as a charging point, a lamp post must adhere to a prescribed standard of earthing, increase the fuse size to cope with the extra energy usage and introduce metering on an otherwise unmetered energy supply. An example of a lamp post charging point is shown in Figure B-1.

Figure B-1: Lamp post charging point

Waltham Forest aims to introduce 60 lamp post charging points, in clusters of 2 or 3, between 2018 and 2022.

Floor mounted charging points

Standard 7kW-22kW floor mounted charging points are the most widely available type of charger across London and are suitable for most electric vehicles. Due to their small size (same as a bollard) these can be installed in public on-street locations. Fully charging generally takes 3 to 4 hours.



These generally have dedicated EV parking bays, with signage indicating the maximum stay. This ensures that EV owners can access the charging points and that they vacate the space once charged (due to the maximum stay restrictions) to open the space up for another EV user. Users need to set up an account as members of the charging network the charging point is connected to, which enables a user to pay via an RFID card or a smartphone app.

Waltham Forest aims to introduce 120 standard floor mounted charging points, with 2 charging point bays per location, between 2018 and 2022.

An example of a floor mounted bollard style charging point is shown in Figure B-2.

Figure B-2: Floor mounted bollard charging point

Rapid charging points



Rapid 50kW chargers can charge a vehicle in less than an hour, making them vital for long distance travel and taxi drivers. Due to their larger size, these chargers are only suitable in off-street locations, such as car parks, and often form part of a 'hub' of 5 or more charging points. They otherwise operate in the same way as the 7kW-22kW Floor Mounted charging points.

Waltham Forest aims to introduce 20 rapid charging points between 2018 and 2022.

An example of a rapid charging point is shown in Figure B-3.

Figure B-3: Rapid charging point

Oxford City Council - electric vehicle charging

Oxford City Council carried out a trial of five different on-street EV charging technologies in 2018, including lamp post chargers, three types of bollard chargers and a home charger coupled with a channel (often utilising existing storm drain channels) to allow the cable to be trailed across the footpath.

Criteria and evaluation

The criteria used to evaluate the performance of the charging technologies were as follows:

- *Ease of access* - based on proximity of the charger to the resident's home, availability of one or more dedicated parking bays and ease of parking
- *Ease of use* - Based on the user friendliness of the cable, installation interface and smartphone app
- *Installation footprint* - measure of how seamless the technology is integrated into the streetscape, in terms of risks to vehicles and other street users as well as aesthetics
- *Robustness* - measure of the reliability of the equipment and resilience to vandalism and minor collisions
- *Data and billing* - based on if the usage data and billing is accurate, quick and easy to understand and access (assessed from the perspective of interviewees)
- *Maintenance and repair* - measured by the ease and speed the technology can be repaired, how easy it is for users to report faults and the ability to see which alternative charges are operational
- *Price* - based on the cost of charging (£ per kWh plus connection fee), relative to other charging options, fossil fuels and electricity in one's home
- *Speed of charging* - assessed by comparing reported power outputs, with actual charging data from the trial
- *Utilisation* - refers to the extent to which a charging point is used over a period of time
- *Adoption capacity* - the potential for adoption by new or extra users, determined by the number of ports available, interoperability and whether the location of the installation restricts access and use
- *Neighbour complaints* - based on the frequency with which users and non-users in the vicinity of an installation raise objections with the local council and the nature of the complaints
- *Commercial sustainability* - based on the extent to which there is a business case for sufficient profit to be made by manufacturers and operators

Table B-1 summarises the evaluation scores for each type of technology, with 1 being very poor / low and 5 being very good / high.

Table B-1: Criteria evaluation

Criteria	Lamppost charger	Bollard style chargers			Home charger
	Ubitricity	Chago station	EVolve E-post	Zeta Smartscape	APT
Ease of access	4	5	5	5	2
Ease of use	4	3	4	4	3
Installation footprint	5	2	2	2	3
Robustness	4	2	5	1	4
Maintenance and repair	4	2	4	2	3
Price	3	4	4	4	5
Data and billing	4	4	4	5	5
Speed of charging	4	4	4	4	5

Criteria	Lamppost charger	Bollard style chargers			Home charger
	Ubitricity	Chago station	EVolve E-post	Zeta Smartscape	APT
Utilisation	4	3	3	2	5
Adoption capacity	2	5	5	5	1
Neighbour complaints	4	1	1	1	5
Commercial sustainability	4	1	1	1	2
Total score	46	36	42	36	43

The lamppost charger scored the best overall, followed by the home charger. All three of the bollard style chargers scored lowest, with the EVolve E-post the highest out of these.

The criteria where both the lamppost and home chargers scored the lowest is in adoption capacity. For the lamppost charger, users need to buy a Smart Cable costing £199 which may be a barrier to wider adoption. Existing lamppost placement may also constrain implementation, and those within controlled parking zones will limit visitor usage. For the home chargers, there is a very limited potential for wider adoption due to the private nature of the installation.

The adoption capacity is where the bollard style chargers excelled, which each achieving the highest possible score. However, they all received numerous neighbour complaints relating to the dedicated parking bays increasing parking pressure and restricting access to shops and services. Complaints were also made in relation to the time taken to connect to the electricity supply and due to periods of breakdown. The bollard style chargers also scored very poorly for commercial sustainability, due to high costs of installation and low utilisation.

Signage

Where a dedicated parking bay for EV charging have been put in place, a sign has been installed to explain the rules associated with its use, as shown in Figure B-4.



The sign stipulates that the use of the space from 08:00 to 18:30, Monday to Saturday, should be limited to 3 hours. It can be used by any EV owner, but only for charging. Outside of these hours, it should be used only for charging, and only by permit holders.

This is a complex set of rules, which was misinterpreted or ignored by both trial participants and local residents in several instances. Most commonly, it was assumed that outside the restricted hours the space can be used by non-EV permit holders.

The size of the sign was also a cause for concern. In a conservation area, trial participants declined the option of having a dedicated bay due to the size and appearance of the sign.

Figure B-4: Official sign for dedicated parking bay with bollard style chargers

Appendix C. EV on-street charging point request proforma template