

Amey

EV Strategy Report

**Tamworth Borough Council Electric Vehicle Strategy
Rp001 / v2.1**

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1. Introduction

1.1. Purpose

Tamworth Borough Council (TBC) has commissioned Amey to develop an Electric Vehicle (EV) Charging Infrastructure Strategy. This Strategy report will coincide with the findings and recommendations of an earlier work undertaken on behalf of Staffordshire County Council (SCC) to generate an Electric Vehicle Strategy. TBC's own EV Strategy shall align with the previous work but shall provide a richer local, rather than regional, update of previous assessments.

The Staffordshire EV Charging Infrastructure Strategy explored the potential growth of charging infrastructure across the county, including Tamworth. The strategy aimed to coordinate the development of accessible chargepoints and support local authorities, residents, businesses, or others looking to install chargepoints through providing information and guidance.

It established that the role of the SCC is to coordinate and facilitate the development of a charging network that meets the needs of the people of Staffordshire, including the equitable distribution of infrastructure and reducing risks associated with poorly located and/or insufficiently maintained facilities. This understanding of the role has been applied here to TBC with a recognition that some elements of flexibility and resilience can be better mitigated or withdrawn through a more local approach.

This Strategy shall provide more depth to local and national policy as relevant, a bespoke evaluation of the state of the market in relation to existing chargepoint provision in Tamworth and with a more localised view of propensity for EV demand, points of interest and network capacity in the borough. Other areas included in the scope including Open Charge Point Protocol (OCPP) considerations, commercial models, the vision, accessibility, funding, and recommendations are also addressed.

The Strategy, whilst aligning with the Staffordshire EV strategy, has implemented significant effort to ensure that this commission offers a richer and more localised context for TBC and its residents. This will coincide with national and local ambitions towards decarbonisation and air quality improvements, such as the reduction in levels of Nitrogen Dioxide (NO₂) associated with road vehicles and provide accessibility to charging points for all residents across the borough.

It is also recognised that to meet the objectives of the SCC strategy (as adopted by TBC's Cabinet in April 2023) considerable collaboration with SCC is needed to ensure accessibility and affordability ambitions are met for those users without access to a driveway. TBC are not alone in undertaking this work and SCC have already completed several aspects of the work required in relation with demand and energy grid capacity studies to identify target areas.

1.2. Approach

This analysis seeks to apply a more local focus on the work completed for SCC in 2023. This work therefore aligns with the SCC approach and will involve capturing the wider context of Tamworth in terms of demographics, geography, and current EV infrastructure and comparing these against regional and national figures.

To achieve this, the Strategy comprises of a local literature review, an overview of chargepoint technology with a focus on accessibility and smart technologies, a commercial review detailing the benefits, risks, and responsibilities of each approach, insights into charge point provision, identification of locations that will benefit the community, and recommendations for successful deployment of chargepoints in Tamworth.

The EV Strategy for Tamworth is aligned to the Staffordshire EV Strategy, but the local context will help inform the key recommendations bespoke to Tamworth. This will allow for early mitigation of pain-points and satisfaction of current needs. As a result, this approach will guide the creation of a comprehensive EV Strategy for TBC.

1.3. Context

- Demographics data

According to the most recent census data (Office for National Statistics, 2021), the population in Tamworth is approximately 78,000 reflecting an increase of 2.3% since 2011. This growth rate is slower than was recognised for England as a whole (6.6%) or the West Midlands region (6.2%). Being the ninth most densely populated of the 30 local authority areas, Tamworth occupies roughly 21 km², this equates to 3,645 residents per square kilometre.

Table 1 presents a comparison of Tamworth’s age demographics between 2011 and 2021 census:

Age	Population		Comment
	2011	2021	
65 and over	11,144	14,800	Increased by 32.8%
15 to 64	51,277	49,900	Decreased by 2.8%
Under 15	14,392	14,000	Decreased by 2.7%

Table 1 - Tamworth’s population age comparison (2011 - 2021 census). Source: ONS 2021 and 2011 census.

In terms of employability, of those residents aged 16 and over, and excluding full-time students, 58.3% said they were employed, showing a slight decrease from the 50.6% recorded in 2011. Nevertheless, unemployment has also fallen with 2.7% registering as unemployed in 2021, compared with 4.1% in 2011. Finally, the percentage of retired residents in Tamworth has increased from 20.3% (2011) to 22.8% (2023).

- Implications of demographic data

To demonstrate the EV chargepoint needs of the region, according to the Staffordshire EV Strategy, 97% of households that do not have access to off-street parking are not within a 5-minute walk of a public chargepoint which equates to approximately 92,000 households.

Figure 1 presents the access to on-street and off-street parking in Tamworth (Field Dynamics and ZapMap, 2023)

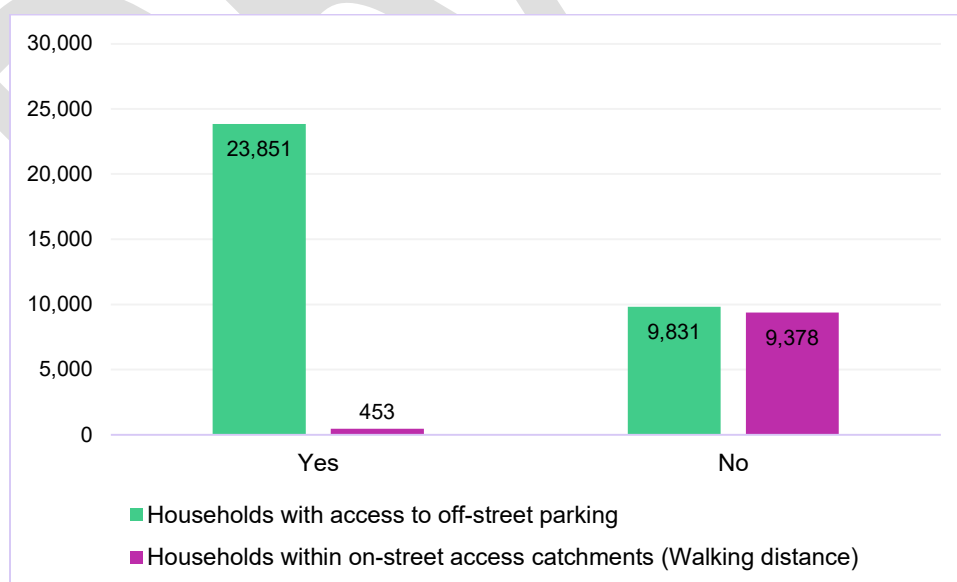


Figure 1 - Tamworth households without access to off-street parking, own elaboration derived from Field Dynamics and Zap Map

It has been observed that a considerable portion of households, which is approximately 71% or 23,851, have access to off-street parking. However, there are still 29% or 9,831 households without it. What's worth noting

is that 95% (9,378) of residential properties without off-street parking are more than a 5-minute walk from an existing EV charger site, thus highlighting the need for chargepoint provision.

As more people adopt EVs, there will be an increased need for EV charging. To meet this demand, the council should ensure that there are enough public charging points for those without access to off-street parking. Providing these charging points early on can help build trust among the public and encourage more people to switch to EVs.

- **Transport data**

From work completed for the Staffordshire EV Strategy and reviewing currently available chargepoints, EV infrastructure deployment in Tamworth is increasing but falls short when compared with the West Midlands. Figure 2, taken from ZapMap in mid-October 2023, highlights the six charging locations available for public access although all but two (both located within the Ventura Shopping Park) are on private land associated with Morrisons (supermarket), WH Horton Ltd (bathroom supplies), Premier Inn or Holiday Inn (hotels). Across these locations, are combination of slow, fast and rapid infrastructure is available with most (4 of 6) only offering slow (7kw) charging.

The main focus of this approach is to establish a chargepoint network that is fair and accessible, with priority given to the 9,378 households who lack off-street parking and are situated outside of a 5-minute walk from a public chargepoint.

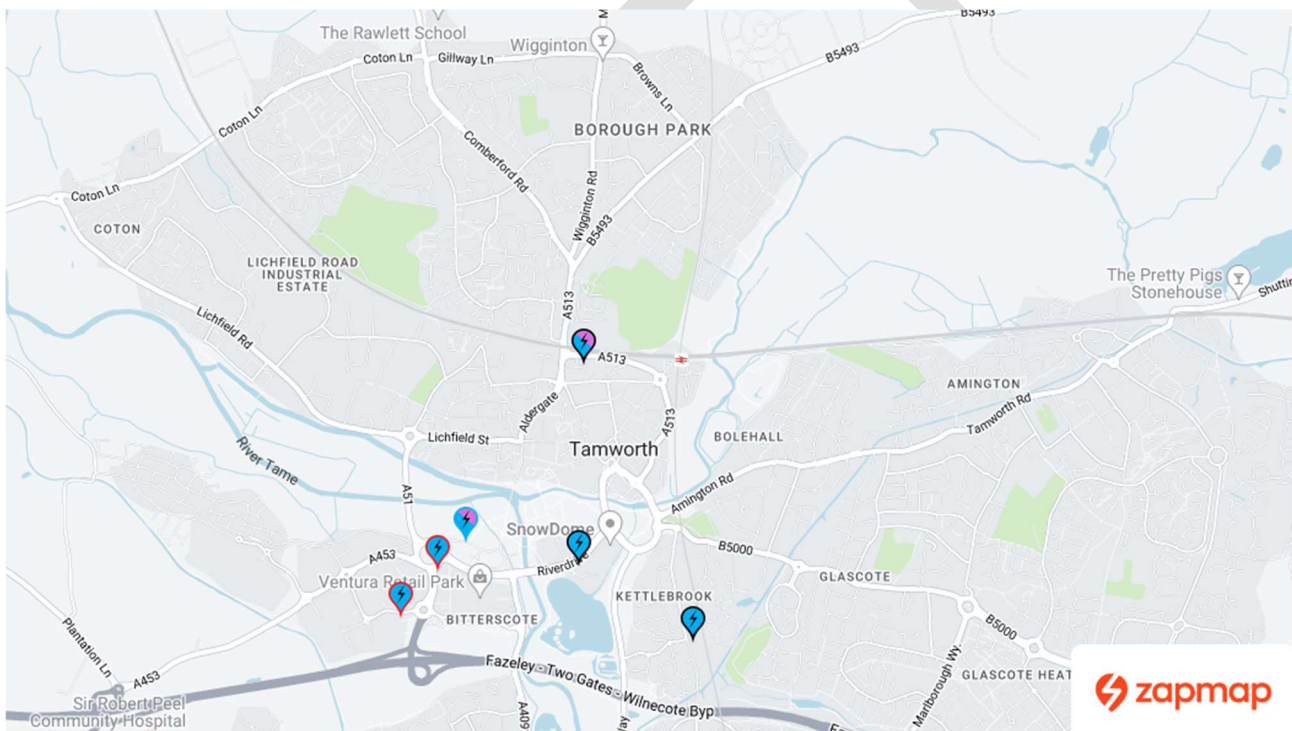


Figure 2 - Map showing publicly available chargepoints in Tamworth

It is important for TBC to take into consideration the involvement of the private sector in meeting the current and future needs of the area. TBC should engage with the relevant stakeholders to identify the necessary actions that need to be taken. This involves striking a balance between current demands and anticipated future needs, as the adoption of EVs increases among the public. Additionally, it's crucial to assess the extent to which current usage and charging patterns are indicative of the evolving trends among the growing population of EV users.

2. Policy review

To ensure that Tamworth's EV Strategy is reflective of the current conditions, the policy review takes stock of national, regional, and local policies that will be fed into Tamworth's EV strategy. Firstly, the national objectives are discussed and the plan to reduce transport emissions. Secondly, the key objectives of the Staffordshire County Council EV strategy will be highlighted to ensure that the Tamworth outcomes are aligned. Finally, other local policies that will impact the EV strategy, such as local transport and corporate plans will be assessed.

This process will set the direction for the Tamworth EV strategy and ensure that local needs are addressed while adhering to the overarching direction of the region.

2.1. National policies

The UK's Net Zero Strategy (BEIS, 2021) introduced in 2021, sets out the policies to support the decarbonisation of UK industry including Transport. Transport is one of the largest polluting sectors in the UK, and particularly road transportation which accounts for 91% of all transport emissions demonstrating a need for action.

The strategy sets out a number of key policies to support the decarbonisation of the sector including, a zero-emission mandate starting from 2024, which will progressively see more EVs on UK roads and recently updated targets have been set to end of the sale of petrol and diesels cars and vans by 2035. These commitments were further highlighted alongside a 2035 delivery plan within Transitioning to zero emission car and vans (Department for Transport, 2021).

To facilitate and encourage more zero-emission vehicles, the Staffordshire EV Strategy published in 2023 by Staffordshire County Council, highlights the need for a tenfold increase in public charging by 2030. The approach emphasised by the strategy aims to be holistic and fair, catering to the needs of the entire population, whether they are residential or on-route. This will be achieved through various forms of charging, including en-route and destination charging, as well as on-street and residential hubs. The goal is to have a minimum of 300,000 public chargepoints by 2030, which could potentially increase to 700,000 if there is a higher prevalence of on-street charging.

2.2. Staffordshire regional policies

Strategic Plan 2022-2026

The Strategic Plan (Staffordshire County Council, 2021) establishes a comprehensive vision for the future of Staffordshire along with multiple strategic priorities and ambitions for sustainable growth, enhancing the lives and livelihoods of residents through innovative solutions and a community focus. The three key outcomes are set as:

- Have access to more good jobs and share the benefits of economic growth.
- Live in thriving and sustainable communities.
- Be healthier and independent for longer.

While the priorities are defined as being:

- Support Staffordshire's economy to grow, generating more and better paid jobs.
- Tackle climate change, enhance our environment, and make Staffordshire more sustainable.
- Encourage good health and wellbeing, resilience, and independence.
- Fix more roads and improve transport and digital connections.
- Offer every Staffordshire child and young person the best start in life, and the chance to achieve their potential.

These are all under the single pledge to “Live within our means and deliver value for money” which clearly demonstrates that whilst significant appetite exists for innovative solutions for recognised problems might occur – fundamental assurances and evaluations must happen first.

Although there is no explicit reference to EVs, addressing climate change and enhancing transportation and digital connectivity implicitly acknowledges their potential influence. Nevertheless, any EV solutions that aim to resolve problems related to decarbonising transportation must be introduced responsibly in collaboration with local communities, partners, and businesses.

Staffordshire Climate Change Strategic Development Framework

The Staffordshire Climate Change Strategic Development Framework (Staffordshire County Council, 2020) outlines the steps that the county council will take to decrease carbon emissions in the region. One of the primary policies is to ensure that all council services are aware of the importance of reducing carbon emissions and are dedicated to doing so. This entails decreasing the emissions produced by the council's fleet and promoting the use of low-emission vehicles, as well as decreasing reliance on vehicle travel and encouraging the use of active travel alternatives across the region.

The updated Staffordshire Climate Change Action Plan (Staffordshire County Council, 2022), acknowledges the necessity of taking multiple measures to monitor, decrease, and ultimately eliminate the carbon emissions produced by the Council. These measures include putting a stop to carbon emissions altogether, finding ways to remove existing carbon emissions, and assisting communities and businesses in preparing for the effects of a shifting climate. In support of reducing vehicle emissions key policies include:

- Collaborate with district and borough councils to develop a unified strategy for implementing electric vehicle infrastructure throughout Staffordshire.
- Maintain communication with them to explore ways in which climate change mitigation can be factored into planning considerations.
- Ensure sufficient resources are available to support business areas in identifying opportunities and understanding carbon impacts.
- Investigate the transitions of Council fleet to alternative fuels or more carbon efficient options where appropriate by 2025.
- Work with Amey to roll out EV charging across all highway's depots.

Staffordshire Local Transport Plan

The Staffordshire Local Transport Plan to 2026 set out several key policies to help improve the transport network, while reducing emissions and supporting modal shift. The strategy notes that 34% of all carbon emissions come from road transport in Staffordshire, highlighting the need to act.

Key policies include:

- Reducing transport emissions and the impact it has on the Highway Network which include promoting the use of EVs and investing in charging infrastructure.
- Promote alternatives to private vehicles by investing in active travel methods including the increase of public transport patronage.
- Support economic growth and regeneration.
- Help improve social inclusion and ensure equity across the region.

Staffordshire's regional policies are centred on reducing carbon emissions in transportation, with a focus on road transportation. To achieve this goal, they prioritise encouraging the adoption of EVs and the necessary infrastructure to support them. Additionally, they promote the use of public transport and active travel models while keeping the needs of the entire region in mind when making decisions.

2.3. Staffordshire EV strategy

In January 2023, the Staffordshire EV Strategy was released, and covers multiple aspects such as policy, funding, and technology. The strategy outlines five different charging solutions, including EV charging hubs, EV forecourts, on-street charging, residential off-street parking, and off-street charging. Furthermore, the strategy considers the current and future demand for each district and borough in Staffordshire, as well as the entire region, to aid in strategic decision making.

The strategy makes clear recommendations to ensure that chargepoint deployment in the region is successful including:

- **Engage the market:** Local authorities should review this EV Charging Strategy and ensure feedback they receive from chargepoint users and stakeholders at key delivery points is included in further plans and actions.
- **Procurement:** Local authorities should engage with their procurement teams to assess the appropriate avenues for procurement, considering the operating and commercial models that are optimal for each local authority.
- **Charging infrastructure locations:** Local authorities should ensure a feasibility study is undertaken that follows good practice with well-developed processes and procedures for installing any chargepoints that will be publicly accessible. SCC will continue to engage with all district and borough councils to provide a consistent approach to EV rollout across Staffordshire.
- **Chargepoint operators (CPOs):** District and borough councils should engage as a group with private chargepoint operators to ensure they follow best practice and encourage charging solution at locations tailored to the requirements of each area, for the benefit of as many citizens as possible.
- **Monitoring the network:** Each district and borough council should ensure a monitoring system is in place to review the impact of their EV charging strategy and feed this back to the public where relevant.

These recommendations and guiding principles will be used as the baseline for Tamworth's EV strategy. At the same time, the specific charging infrastructure needs for Tamworth will be addressed as part of the strategy development.

2.4. Tamworth policies

At a local level, Tamworth has developed initiatives to support the transition to sustainable transport including the addition of new bus services, enhancing access for sustainable modes at the Ventura retail park and improving the overall condition of multiple bus shelters and the mainline Tamworth Rail Station (Tamworth Borough Integrated Transport Strategy 2015 – 2031).

The TBC Local Plan 2006-2031 (Tamworth Borough Council, 2006) corresponds with these initiatives and the underlying ambitions by setting out the policies and strategies to regenerating existing plans and lays the foundation to deliver a sustainable and connected town. Two critical policies include developing a sustainable transport network that supports the Staffordshire Local Enterprise Partnership to improve the transport network for all users, prioritise more sustainable transport modes, and raise awareness on environmental issues. The second key policy is delivering sustainable transport which will be achieved through travel planning and ensuring new developments have sustainable travel at the core of the process.

In addition, the TBC's Corporate Plan (Tamworth Borough Council, 2021) to 2025 sets out the plan for the council over the next 3 years which includes, a review of the local plan to improve the transport links within Tamworth and improve existing walkways and cycling routes. The plan also highlights some achievements to date such as establishing a contract with an electric vehicle chargepoint supplier for 4 fast chargers on designated council car parks.

3. Technology and market assessment

This section covers the essential technologies for chargepoints, key considerations such as user access and the potential commercial models available for deployment. This knowledge will be crucial for developing the strategy and making effective recommendations. Aiming to present a tailored perspective on the current opportunities relevant to TBC, this section evaluates the established and advancing EV charging technologies, existing commercial models, accessibility considerations, smart charging protocols and other associated innovations. The methodology relies on a combination of desk-based research and our in-house expertise to pinpoint potential gaps and identify emerging trends in the market.

3.1. Technology review

The progress of EV charging technology has primarily been led by private initiatives covering not only the initial development of technical solutions, but also their operation and maintenance. In this context, the demand and market expansion has shown a continuous growth, becoming increasingly appealing for these companies to explore faster and more advanced technological solutions. In addition to the charging technology, particular attention has been given to developments in EV technology and to battery capacity as it continues impacting charging time, and therefore user's behaviours.

In this context, a key element to highlight is the lack of a consistent terminology, which encompasses aspects ranging from charging speed to the technological requirements for utilising EV chargepoints facilities.

EV charging modes and EV charging speed

The '*BS EN 61851-1-Electric Vehicle Conductive Charging System Standard*' outlines four different charging modes, each delineating the circuit type, socket configuration, and subsequently, the available power capacity. Moreover, these modes have an impact on the charging speed, and it is worth noting that not all the modes are compatible with every EV. With ongoing innovations in the market, it is anticipated that these definitions and standards will undergo continuous modifications, updates, and further development.

The following is an overview of the various contexts in which these modes and EV charging speeds are observed in the market.

- **Mode 1:** Covers the charging of an EV through a standard 13-amp/three-pin plug socket. This mode is the least recommended for public use, primarily because it offers limited protection due to the absence of an in-cable control box (ICCB), which ensures safe communication between the outlet and the vehicle during charging. Typically used for e-bikes and e-scooters.
- **Mode 2:** Uses a standard 13-amp/three-pin plug socket, with a significant feature being in the inclusion of an in-cable control and protective device (ICCPD) within the cable. The ICCPD plays a crucial role in setting the charging power to a specific level and offers protection against potential hazards by identifying any current imbalances within the circuits. Can be used in both residential and more public spaces.
- **Mode 3:** Involves the utilisation of a dedicated circuit, users have the option of employ either a tethered (typically bespoke to the specific vehicle to be charged) or untethered cable. Typically observed residential, public, and workplace charging scenarios
- **Mode 4:** As the only mode to provide DC, via a tethered cable, directly to the vehicle by using an integrated charger. Mode 4 chargepoints are commonly in the 20-50kW range and charging in excess of 350kW level may be available in the medium term. This can see an EV charged to 80% in approximately 15 minutes. Typically observed in charging hubs or industrial places, not available as residential charging.

Furthermore, with the expected ongoing growth in the demand for EVs, the importance of dependable and effective charging solutions becomes paramount. Therefore, it is crucial to recognise that charging speed and modes used can also influence user's behaviour.

Figure 3 below presents a visual approach of the different EV charging devices speed considered and their capacity (kW), aligned with the new criteria adopted by the DfT in November 2023 (Department for Transport - DfT, 2023).



Figure 3 - Charging Speeds Considered

As part of the market split in terms of EV charging speed devices in the UK market, as of October 2023 considers a total of 49,220 public EV chargepoints. As observed in Figure 4 below, the current landscape reflects a predominant use of fast charging solutions, followed by slower charging options, with rapid and ultra-rapid chargers making up the third and fourth tiers of prevalence (Department for Transport - DfT, 2023). This distribution underlines the increasing emphasis on enhancing the convenience and efficiency of EV charging devices across different locations.

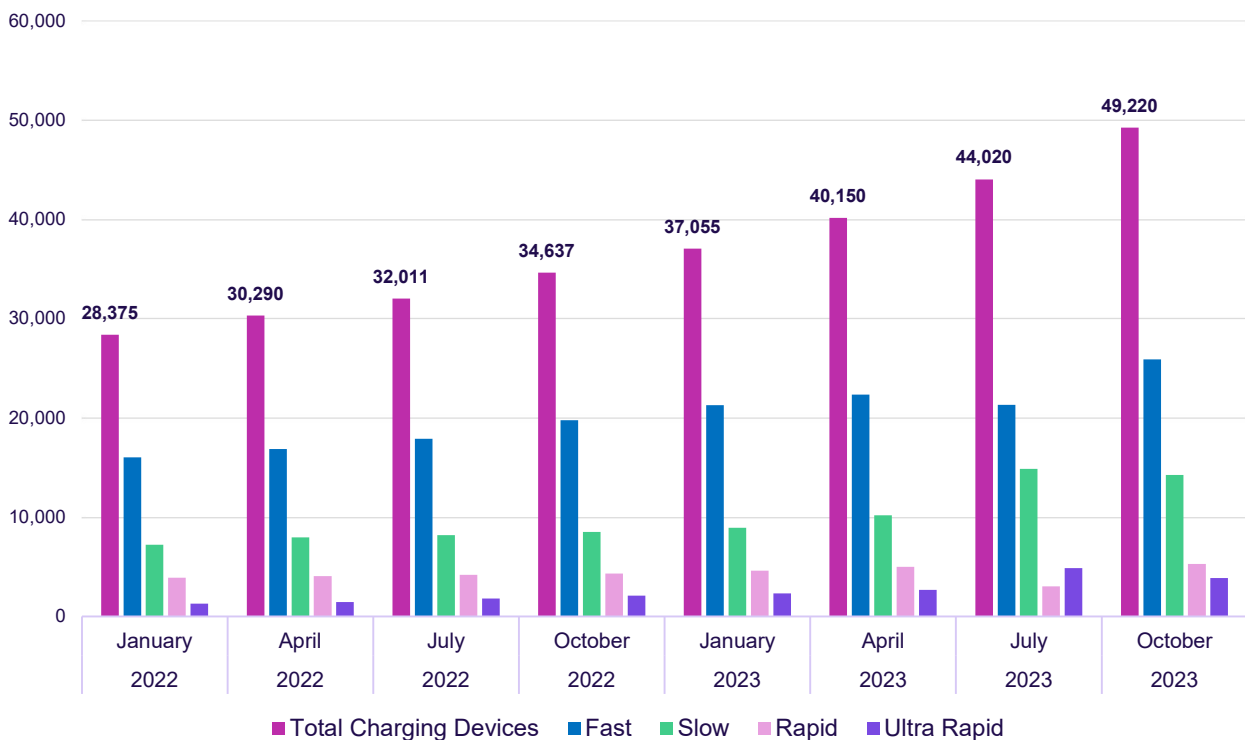


Figure 4 - 2022 and 2023 UK speed of charging devices installed (using former criteria). Source: DfT data published in November 2023.

In Staffordshire there has been growth in the number of chargepoints available, within the last year a total of 80 new EV public chargepoints have become available. Figure 5 presents the publicly available EV rapid and ultra-rapid charging devices by local authority in Staffordshire per 100,000 population. Additionally, as can be observed Tamworth has increased the provision of chargepoints from 3.9 (Oct-19) to 25.4 (Oct-23) EV public chargepoints per 100,000 population in the last four years..

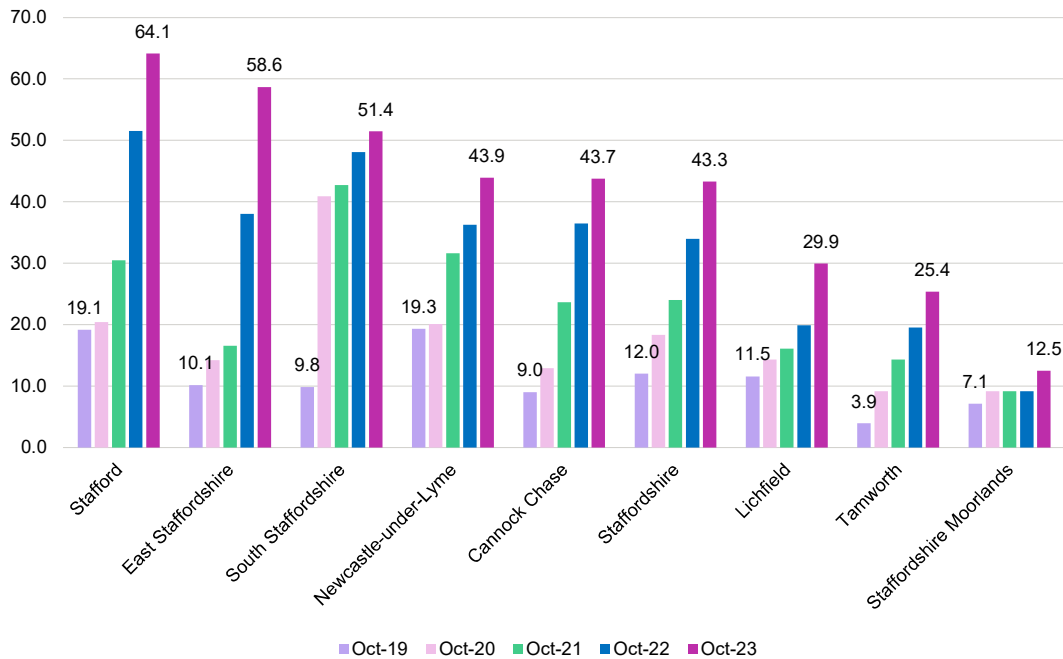


Figure 5 - EV rapid charging or above devices by local authority in Staffordshire per 100,000 population. Source DfT data published in November 2023.

Depending on the specific needs, the council can choose from various chargepoint speeds. Table 2, which follows the criteria implemented by the DfT in November 2023 (Department for Transport - DfT, 2023) provides a description of the available EV chargepoint speeds and their most common use cases.

Speed	Description
Slow	The definition of slow charging solution refers to a charge between 3kW and 8kW and either mode 2 or mode 3. Slow charging devices are typically well-suited for off-street residential use cases, as they allow EVs to charge overnight, aligning with recommendations and guidance of DfT to charge during off-peak hours. These kinds of devices would also be suitable for PHEVs which do not demand a continuously available EVCP.
Fast	The concept of fast charging typically covers a charging ranging from 8kW to 49kW, employing modes 2, 3, CHAdeMO, or Combined Charging System (CCS). Nevertheless, it is worth highlighting that CHAdeMO has restricted used as only certain manufacturers use it, making CCS more popular. As previously noted, when adopting and installing fast chargepoints, upgrades to the power supply may be necessary to ensure the minimum electrical network infrastructure. Fast charging can be delivered through a variety of chargepoints, kerbside units, dedicated parking bays or residential charging units. Fast charging can suit diverse needs and use cases, as they have the potential to become a convenient solution for quick top-ups of EVs while visiting places of interest, such as: supermarkets, hospitals, public car parks, or tourist destinations. Moreover, fast charging proves advantageous in off-street residential set-ups and can be particularly beneficial for households with more than one EV.
Rapid	Typically, Rapid chargers offer a range of 50kW to 149kW. Due to existing constraints within the power grid infrastructure, off-street and on-street residential solutions are typically unable to support rapid and ultra-rapid charging. Instead, such high-speed charging is more frequently available at forecourts, dedicated charging hubs, or commercial venues.

Ultra-Rapid

Covering those charging devices with a capacity over 150kW, ultra-rapid charging technology remains relatively new, with a smaller participation within the current UK market, meaning it may not be compatible with all EVs. The availability of rapid and ultra-rapid charging is generally limited to locations with designated parking bays, offering the advantage of delivering a substantial boost to the EV's battery in a shorter duration. This is particularly valuable at places like service stations, supermarkets, or retail parks, where drivers can efficiently charge their EVs during brief stops. Same as with rapid, ultra-rapid charging also proves advantageous for EV users covering longer-distance journeys.

Table 2 - EV Chargepoint Speeds

EV charging solutions

A variety of charging options are available to meet the needs of electric vehicle users, including those who charge at home or while on the go. To ensure that more people switch to EVs, a comprehensive range of charging solutions is essential. In Figure 6, which considers market trends in the UK and the needs of TBC, you can see an overview of the different chargepoint options. The subsequent section will delve into each solution and its potential use case.



Figure 6 - EV Charging solutions

▪ **On-Street Charging**

These EV charging solutions play a vital role in encouraging the uptake of electric vehicles in residential areas with limited or no private parking space. Often, they come equipped with fast and rapid charging capabilities, serving as a crucial means to facilitate the transition to EVs for private vehicle owners. Initial findings suggest that some local authorities are dismissing certain options, like 'gullies' due to inherent risks and potential liabilities. Since not all households have access to off-street parking, on-street charging facilities present an efficient and seamless alternative to support the transition to electric vehicles.

Examples of existing on-street solutions available in the market are listed in Table 3:

Pop up charger



Source: Urbanfox

These 7kW chargers are designed to limit street clutter and are installed into the pavement that pop-up when required for charging, and then retracts flush to the pavement when not in use. The chargers can also be deployed in car park locations.

The charging units are easily reachable and comply with the minimum socket height requirements outlined in the PAS guidelines. Additionally, they are designed to remain secure and prevent from rising if excess weight is detected. Fully funded or partnership options are available.

Gul-e



Source: Energy Saving Trust

Innovative solution aiming to tackle hazards caused by fixed or event temporary infrastructure on streets, pavement Gul-e's present a solution for residential areas lacking off-street parking. These gullies enable EV users to route a charging cable discreetly and safely from their home chargepoint unit directly to their EV [11].

This solution came as a result of the Go Ultra Low Oxford (GULO) pilot conducted by Oxford City Council in 2017. There most pilots have been small, in 2022, there was roll out of 30 OxGul-e units across the county which includes urban and rural homes. As Gul-e EV chargers adapt to the unique conditions of each household, this innovative solution seamlessly combines the advantages of off-street charging solutions with the flexibility of public EV charging options located near residential areas.

Post-mounted charger



Source: Connected Kerb

One of the most common on-street 7-22kW chargers are post mounted. These chargers often require pavement of have significant space on the street to mount without disrupting people or traffic flow.

These chargers can come with a single or dual socket which would allow two vehicles to be charged simultaneously. Connected Kerb has a unique modular design that separates the underground "brain" of the charger from above the ground socket meaning it can be replaced or upgraded easily. Partially or fully funded models are available.

Table 3 - EV on-street charging solutions

- **Off-Street Charging**

Covering both private and publicly owned facilities, off-street charging solutions typically encompass fast, rapid, and ultra-rapid charging solutions, depending on needs, power network capacity, and preferences. Destination charging within off-street provides a convenient option for EV owners to charge their vehicles while visiting other destinations. These chargers are normally designed to offer a moderate charging rate, allowing EV drivers to top up their batteries over a longer duration.

As off-streets charging solutions offer considered both privately and publicly owned, they can be found in private premises such as offices, depots, or residences (typically covering slow charging solutions) or in places nearby shopping centres, touristic attractions, among others.

- **EV Charging Hub**

EV Hubs represent a significant opportunity to establish a wide-reaching, publicly accessible charging infrastructure. This plays a vital role in the transition to EV, as it addresses concerns about charging availability and range anxiety during longer journeys, thereby enhancing the overall experience for EV users. Typically, EV Hubs provide four or more fast (or even rapid and ultra-rapid) charging stations, often with the potential to encourage the use of other transportation modes.



Figure 7 - EV Hub Dundee source: ChargePlace Scotland

Depending on the scale, EV Hubs can support community uptake in EVs or target high volume traffic routes existing in the county council. Beyond the charging capacity, these hubs have also the potential to serve as versatile spaces, offering additional advantages, including community engagement or retail services.

Recent developments of EV Hubs in the UK have demonstrated the potential feasibility of implementing this charging solution in locations owned by local authorities and where existing facilities are already in place, such as public car parks. This opportunity not only speeds up the deployment process but also reduces the potential costs associated with infrastructure development or land acquisition.

▪ EV Forecourt

Frequently regarded as the future of electric vehicle charging infrastructure, EV forecourts introduce an innovative approach to addressing the demand for EV charging while simultaneously promoting additional activities. In this context, EV forecourt concept takes further the notion of EV Hubs and have the capability to promote economic development and social inclusion (Darwish, Rady, Abbod, Almatrafi, & Lai, 2022). These kinds of facilities, commonly offer rapid and ultra rapid charging options and have the potential to implement innovative solutions such as solar panels, or even commercial partnerships.

Moreover, as the transition process to EVs is undergoing, fuel station or other existing facilities have the potential to support the switch providers could often promote the adoption of EV Forecourt, more detailed approach regarding potential commercial models can be observed in Section 3.2.

Chargepoint accessibility / PAS 1899

The design and installation of chargepoints should be in accordance with the requirements of PAS 1899:2022, a brand-new standard that offers crucial guidelines for creating easily accessible public charging stations for EVs. The design guidance covers signage and information, the built environment, and the process of charging an electric vehicle, including:

- Charging point locations including kerbside, car parks and service stations.
- Charging types including fast and rapid.
- Access needs.
- Journey types including local and long distance.

User considerations

As part of the standard, specific user considerations are highlighted to improve the experience of charging a vehicle. Table 4 **Error! Reference source not found.**, which draws and expands upon Designability's

guidance (Design Guidance for Accessible EV Charging 2022) and outlines the key considerations for Tamworth when installing chargepoints to guarantee accessibility and availability for all users.

Consideration Benefits to user	
Chargepoint	
Information and instructions	Charging can be made simple and reassuring by providing step-by-step instructions before, during, and after the process. These instructions should be visually clear and easy to understand. It's also helpful to provide these instructions in a smartphone app, with information large enough to be read from an appropriate distance.
Positioning and location	When installing a unit, it is important to ensure that all its parts are easily reachable from the ground level where the user will be standing or sitting. This ensures accessibility without any potential obstructions or harm to the user or anyone nearby. Bollards and raised plinths are often apart of the installation setup. Any additional measures should consider access to all types of users.
Charging unit parts	<p>The following features must be seen, reached, and used by both standing & seated users:</p> <ul style="list-style-type: none"> - Cables and connectors - Sockets - Screens - Buttons (start and stopping charging) - Payment terminals - Lights and signage
Signage	
Navigation instructions	Clear and effective navigation signage can be incredibly helpful in saving time and reducing frustration for people looking for charging points. In addition, it can also prevent congestion as users may hesitate or become disoriented when searching for available charging spots.
Information on signage	<p>Important to make clear information such as:</p> <ul style="list-style-type: none"> - Who can use the chargepoint? - What type of charging is available? - Applicable parking charges - Parking time limits
Positioning	It is important to keep in mind that signs that are not placed properly can make it harder to access charging points, so it's crucial to avoid positioning them in a way that could potentially obstruct or harm the user.
Vehicle	
Space around the vehicle	Space around the vehicle can enable or limit the access to a chargepoint. It is important to make sure drivers have the space the space to open and close their vehicle door without obstruction. This includes having sufficient space between the front of the vehicle and the chargepoint to ensure access to all users is possible.
Other	
Lighting and shelter	It is worth noting that disabled individuals may require additional time to enter and exit the vehicle, as well as to navigate around the charging process. This is why it's important to consider their needs when designing and installing chargepoints.
Nearby amenities	Being close to amenities can be particularly important to disabled users how may need access to rest rooms or other services while charging their vehicle.

Table 4 - specific user considerations for chargepoint accessibility

Therefore, the objective of this standard is to support the development of an inclusive EV charging infrastructure. It can aid designers, and installers in anticipating and removing limitations and obstacles that might impede any user from using the chargepoint independently.

Innovation and ancillary facilities

- **Battery storage**

The market for battery storage solutions for SMEs is growing, and there are already offers for systems with storage capacities of 64 to 200 kWh combined with 30kW or 50kW controllers, which set a limit on how much power may be pulled at any given moment (GivEnergy, 2023). The operational lifetime guarantees are getting longer, and costs per kWh are currently often between £600 and £700/kwh installed [ex VAT] (Jackman & Clissitt, 2023). When the future demand for vehicle charging will be significantly higher, monitoring the export power from a new solar array may determine that it would be practical to install a battery storage system to power the EV chargepoint. However, it is important to consider that the storage capacity should be dimensioned to cover, if not all, a certain percentage of charging demand each evening.

- **Smart charging**

Another important characteristic that can be considered during the EVCP deployment is the possibility to use smart functions and load management capabilities. The main goal of “smart” load management is to optimise energy usage and thus reduce grid connection cost and time. Depending on the location of EV chargers, the system’s electrical demand is often higher in certain times of the day and certain seasons of the year with winter evenings seeing the highest demand. Smart charging helps to avoid charging the EVs during these peak hours and or maximise the use during times of renewable energy production. In general, this reduces the costs for generation capacity and the electricity network, which includes the cables and other electrical devices (Department for Business, Energy & Industrial Strategy, 2023).

Another important thing to consider is that smart charging can also be programmed to reduce carbon emissions by delaying the charging from times with high levels of carbon intensity or to times when the grid mix generates relatively low emissions (Tang, Cockerill, Pimm, & Yuan , 2021).

The supplier could also incentivise the change in time of energy demand through demand-side response techniques by increasing user demand for energy when the supply is high or reducing demand when the supply is low. The user plays therefore plays an important role in optimising energy usage in response to better time-based rates or other types of financial incentives (iea, 2023).

- **Open Communication Protocols**

With the objective of facilitating the communication between EV charging stations, network software companies, CPOs and EV users, protocols have been adopted aiming to ensure universal compatibility, shared communication, the availability of up-to-date information regarding the performance of each charge point (Wevo, 2022).

The Open Charge Point Protocols (OCPP) was established in 2009 by the Open Charge Alliance, OCPP is a free to use accessible, open-source protocol to allow the chargepoint to communicate with the chargepoint management system. (Open Charge Alliance, 2023). In addition, other open-source protocols that allow the chargepoint to communicate with other system actors such as energy management systems.

Table 5 presents a summary of each protocol, highlighting the objective, data shared, and use cases.

	Open Charge Point Protocol	Open Smart Charging Protocol	Open Charge Point Interface Protocol
Objective	Allows network managers to select hardware and software from a variety of providers.	Communication bridge between charge point management system and energy management system.	Facilitates roaming across eMobility service providers and Charge Point Operators.

	Open Charge Point Protocol	Open Smart Charging Protocol	Open Charge Point Interface Protocol
Data exchanged	Charge point status, energy usage, and charging session details.	Grid operators, demand response aggregators, or energy management systems. 24-hour forecast of the electricity grid's available capacity.	Charge point status, tariffs, energy usage, charging session details, locations, availability, error codes, and other relevant details.
Use case	When deploying a network of chargers, it allows the council to choose any chargepoint supplier and back-office system that is OCCP compliant.	The 24-hour forecast of the accessible capacity helps optimise charging times for individual vehicles and avoid exceeding network capacity which can increase costs.	Helps promote an improved user experience removing the boundaries between charge point operators and other services.

Table 5 - Protocols comparison

It is important to highlight that the usage of smart charging standards (OCPP or other protocols) is not mandatory in the UK, however, is seen as good practice to enable interoperability, promote innovation, and provide a better user experience.

- **Solar PV power generation**

Solar PV power generation is one of the most affordable ways to supply on-site power generation because it is a well-established, dependable technology. When linking solar PV to EV charging bays, the daytime demand could be offset by the solar generation. This supplies a large quantity of power, especially, throughout the summer daytime period (Solar Energy Technologies Office, 2023).

Depending on energy tariffs and whether about 60–70% of the power generated is used on site, payback for the capital cost of a roof-mounted solar PV system is often estimated to be between 8 years (Jackson, 2023). A significant portion of this generated energy could be used on site, the surplus can be sold to the grid. However, to make the best use of the technology, it would be advisable installing an array in only one site initially and determining the percentage of usage before any further installations. Installing PV in the site with most priority initially would be the most logical solution. The PV scale up across multiple locations has the potential to unpack benefits regarding operational costs, enhance sustainable energy production, and increase innovation at TBC.

3.2. Commercial model appraisal

The selection of the appropriate commercial model will be critical to ensure the long-term suitability of the EV chargepoint network in Tamworth. TBC must carefully consider its willingness to invest, assume responsibility, evaluate potential risk, and consider the potential for generating income that can be reinvested in the chargepoint network.

In this context, it is important to highlight that in addition to the studies and internal considerations done by the council, it is expected that CPOs will assess the worthiness of investing in specific areas or sites. The results of this assessment will influence CPOs decision to invest and their support in terms of contract length, revenue sharing, and other particularities that might be needed for each specific case.

The evaluation process here proposed begins with an analysis of each commercial model, highlight their key Strengths, Weakness, Opportunities, and Threats (SWOT). This provides a concise summary of each commercial model and will facilitate to conduct a comparative analysis. Furthermore, it will enable the council to make informed decisions about each model and identify a suitable model.

In addition to the analysis proposed, it is highly recommended to engage with key stakeholders to identify and validate the thought process and ensure that the findings align with real-world market conditions.

Commercial models

▪ Concession

A concession model offers a hands-off option for councils to implement chargepoints with a less significant involvement. In this model, it is expected that the CPO will fully-fund chargepoints but in return will control most of the decision making. This would likely include, chargepoint placement and types, for example, rapid may be installed, where higher tariff and possible returns are possible but may not be in the best interests of the population.

It is anticipated the CPO would control the tariff, maintenance schedules, and the overall chargepoint experience. While this would alleviate several responsibilities to the council it could also increase the risk of consumer dissatisfaction, performance controls should be agreed and monitored with the CPO over the course of the contract.

It may be possible for the council to receive a small percentage of the revenue share. However, it will be considerably less than what is possible through the own and operate and match-funding commercial models. As the network expands so would the revenue to the council, however, due to the model it would be limited compared to what could be possible.

KEY TAKEAWAYS

- little or no upfront capital costs, which would enable tbc to refocus spending.
- passive approach to chargepoint provision, little or no control, which may not benefit the population.
- limited revenue share, less opportunity to reinvest and influence the expansion of the network.

▪ Land rental

In a similar way to the Concession model, the land rental can be a more passive approach to chargepoint provision, where land or car parking spaces are rented to the CPO for a fixed term, which will allow the CPO to utilise the space for chargepoints. The CPO would be responsible for install, commissioning, and operational needs. This would therefore relieve the responsibilities from the council. In return, the CPO would expect to have control over what chargepoint/s to deploy, setting the tariff and to take most of the revenue.

This would provide Tamworth with reoccurring revenue stream regardless of the utilisation of the chargepoint, which would be at the CPOs risk. Therefore, this model may only be attractive to CPOs where a return is possible in the short to medium term, which may rule out rural communities. The key benefit compared to other business models is that revenue would be generated from day one with little investment and risk. Whereas the other models discussed would generate revenue based on utilisation which may take time to establish.

It would also tie up the space for the length of the contract. In some cases, these spaces could be best utilised for other purposes such as mobility hubs or other purposes. Initial feasibility could help identify spaces that would be best utilised for chargepoints and therefore identifying where the Land Rental model could be successful.

KEY TAKEAWAYS

- establishes a fixed revenue stream for Tamworth. the more spaces that are rented the greater the revenue.
- reduced responsibility on Tamworth, most of the risk lies with the CPO.
- CPO is likely to only rent space where they know a return is possible.

▪ Match Funding

This model would typically involve sharing the capital costs responsibilities in some cases 50/50 between the council and the CPO. Therefore, this would alleviate some of the capital costs required in the own and operate model. A revenue share would then be determined and agreed by the two parties. The start of the revenue share may begin once some of the initial investment is paid back.

It is possible to serve rural communities in this model. However, it is likely that a CPO would want to take a portfolio approach (the entire network) to deploy in these areas and may also take a higher revenue share to

compensate for possible lower utilisation rates and higher operational costs. In addition, chargepoint placement and type would likely be a joint decision with the CPO and therefore, the council may have to compromise.

This model would likely reduce the risks to TBC as installation, maintenance, and back-office solutions can be the responsibility of the CPO. However, while the tariff can be influenced by the council, the CPO would also have power in the decision.

KEY TAKEAWAYS

- share the upfront capital costs with the CPO. savings can be reallocated.
- ability to serve rural communities through a portfolio approach. revenue share can be adjusted to make rural areas more attractive to CPOs.
- share and lower the level of risk and responsibility of the network. could also lower the level of influence.

▪ Own and Operate

This model would require the greatest level of investment and potential risk for Tamworth but would also provide the greatest level of flexibility with the chargepoints. Should the council make the decision to own and operate chargepoints all the capital costs (hardware, civils, install, commissioning) would need to be covered. In addition, maintenance and ongoing operational costs would be the responsibility of the council, with the option to be contracted out. The chargepoint management solution and the overall customer experience would also be the council's responsibility.

While this model would take place a higher level of responsibility and risk on TBC it also provides significant opportunities. A concession agreement (or match funding) will often require the placement and charger types to be agreed upon between the parties with utilisation being a key consideration. While utilisation is important, this model would allow the council to make independent decisions that has the needs of the population at the forefront. In addition, tariff setting, and dynamic pricing can be a mechanism to attract users as well as generate significant revenues which can be reinvested back into the network.

However, this model would require a greater level of operational and legal expertise in the chargepoint installation and maintenance programmes – which could become a risk as the network expands and responsibilities increase. Furthermore, software solution experience would be required for the back-office and front facing application for users. It is important to note, that this arrangement the council could own the infrastructure and revenue generation, but the CPO manages the back-office for a fee therefore, responsibilities could be outsourced to a third-party for an agreed fee which could lower the risk levels but also level of influence.

KEY TAKEAWAYS

- all capital costs covered by TBC. LEVI funding can be utilised to support.
- ability to shape the deployment schedule based on user needs.
- high level of risk and responsibility placed on TBC. However, could be lowered through outsourcing some of the responsibilities such as back-office management to a third-party.

SWOT Analysis

To obtain a thorough understanding of the commercial models existing in the market, a SWOT analysis was performed to provide insights into the choices accessible to TBC. This analysis was carried out to ensure that the findings align with the prevailing market conditions. Additionally, this approach will assist Tamworth in streamlining the available options and pinpointing the most suitable course of action.

Figures 11 to 14 below present a SWOT appraisal for each the commercial models available. It is important to highlight that variations of these models may be available, as particular conditions can be agreed. Therefore, further engagement is advised aiming to identify efficiencies and flexibility between parties.

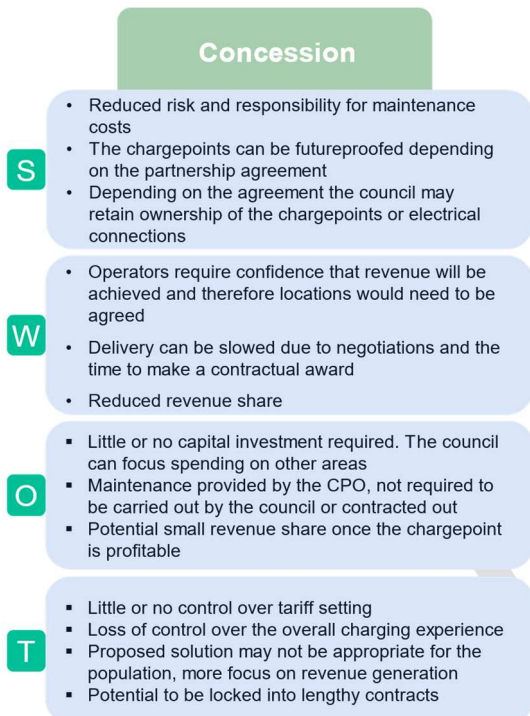


Figure 8 - Concession SWOT Analysis

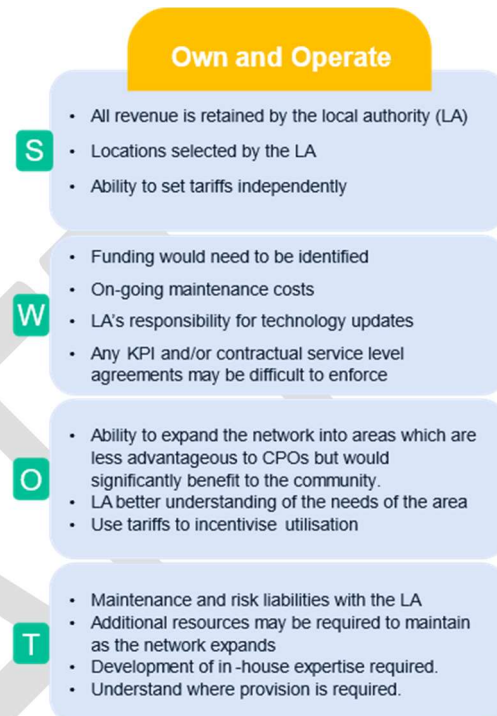


Figure 9 - Own and Operate SWOT Analysis

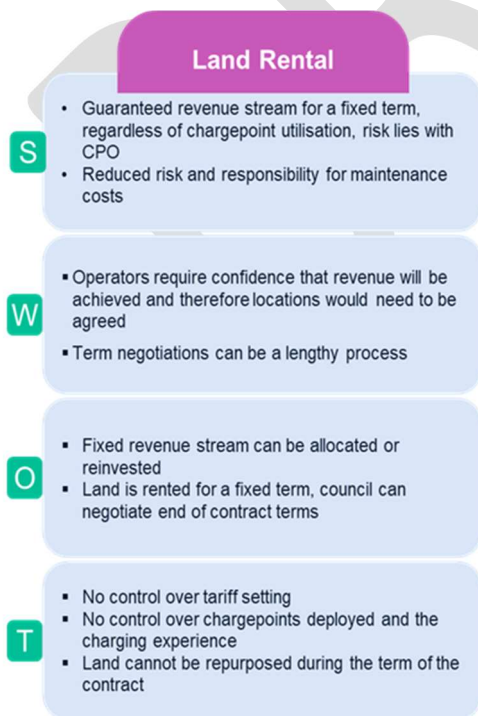


Figure 10 - Land Rental SWOT Analysis

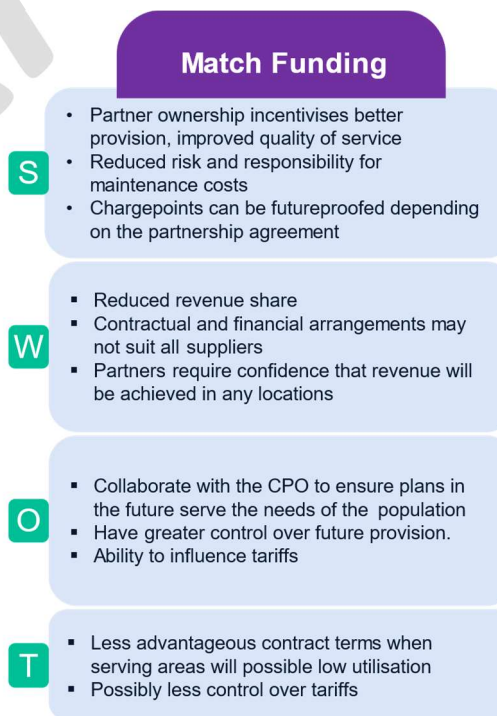


Figure 11 - Match funding SWOT Analysis

Commercial model considerations

To digest the commercial models that are outlined in the SWOT analysis, it is important to focus on those specific factors present in Tamworth that should be considered when deciding on the most suitable commercial model. Additionally, it is worth emphasising that the following considerations are based on a general overview of each commercial model. It is highly advisable to engage with relevant stakeholders as the particulars of each commercial model may vary depending on specific requirements and needs.

When deciding the specific commercial model to implement, Tamworth should consider the differing trade-offs in terms of capital investment, revenue-sharing, roles and responsibilities of each party, service level expectations, and length of the contract. Additionally, to effectively navigate this dynamic landscape, Tamworth should prioritise the engagement with CPOs, as they would play an integral role in the EV and provide valuable insights and expertise that can help identify the potential variables and flexibility of different commercial arrangements.

Finally, it is important to highlight that current funding streams such as the Local Electric Vehicle Infrastructure (LEVI) encourage local authorities collaborate with CPOs when deciding on the commercial model and delivery of chargepoint provision. Therefore, models like concessions or match-funding which public and private entities collaborate to establish partnerships with the goal of ensuring the implementation of necessary infrastructure in each local authority.

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3.3. Funding opportunities

The Staffordshire EV strategy detailed the various funding options that could aid the deployment of charging infrastructure in the region. The Local Electric Vehicle Infrastructure (LEVI) fund is an essential factor in fulfilling on-street charging requirements. We have provided specific details regarding the eligibility criteria and conditions for LEVI, along with additional funding options that can assist in fulfilling the broader requirements of Tamworth.

Local Electric Vehicle Infrastructure (LEVI)

The LEVI fund aims to support local authorities across England during the roll out of EVCP to support on-street provision. Nevertheless, there is a certain level of flexibility as applicants can also include potential EVCP covering tourists, commuters, taxis, and commercial vehicles (Department for Transport - DfT, 2023). In anticipation of the application submission on 30th November below are key elements we advise considering when populating the form.

- Tamworth must reflect that the majority of the EVCP will benefit residents without off-street parking.
- Tamworth can identify additional beneficiaries, e.g., taxis, commuters, commercial vehicles (but must be the minority).
- To best serve LEVI's target users, local authorities should either keep control over where chargepoints are placed or work together with the CPO to make these decisions.
- As stipulated by the fund, most of the costs of a project must be related to the installation of lower-powered infrastructure suitable for local charging (<22 kW). Other chargepoints are accepted in the minority.
- Renewable energy generation such as solar canopies and battery storage is eligible.
- Tamworth should not include EVCP for locations such as: workplaces, off-street parking. There is also a restriction to include potential chargers covering buses or heavy goods vehicles.

Despite the fact the LEVI fund application is, in general terms, flexible in terms of the project completion and the potential beneficiaries, Tamworth must identify the rationale regarding the EVCP location, and clearly highlight the reasoning and evidence value for money.

Figure 12 below shows the expenses typically covered by the LEVI fund during the EVCP deployment:

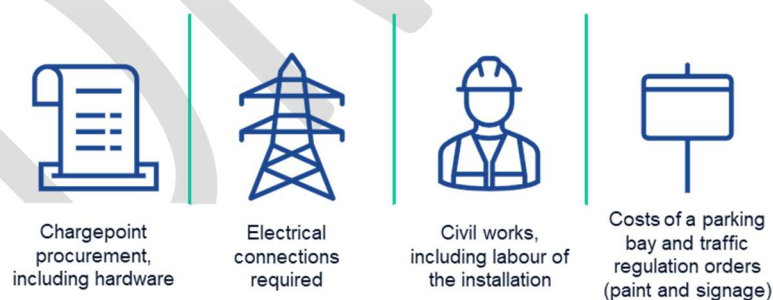


Figure 12 - LEVI expenses covered

It is acknowledged by our own expertise working with local authorities across England, that CPOs have in some cases developed their market offer that includes LEVI funding and therefore should be used as a tool to potentially agree the terms in either fully-fund or match fund scenarios.

Staffordshire County Council with support from 13 local authorities that includes TBC, together with regional transport body Midlands Connect, has successfully bid for a total of £39.3 million from the LEVI scheme.

SCC is taking the lead in the delivery of the LEVI fund project. TBC will support with further information regarding site identification such as, land ownership, wayleaves etc. SCC has been awarded an indicative amount of £4,588,000 capital funding and are in the process of recruiting an Electric Vehicle Project Manager that will support TBC and other officers across the County to roll out the proposed infrastructure.

The LEVI funding will be used to install public chargepoints for the 92,000 Staffordshire homes that are without off-street parking and are not within a convenient distance of a chargepoint. Charge points will be installed between 2024 and 2028. 2,657 charging sockets has been forecasted to be installed across the County. A high-level site identification exercise for Tamworth has been submitted based on demand analysis.

On-Street Residential Chargepoint Scheme (ORCS)

The ORCS has represented a vital initiative in the UK designed to assist local authorities in the establishment of EV charging infrastructure for residents, specifically those who do not have access to off-street parking (Office for Zero Emission Vehicles, 2023).

Recent amendments have been adopted aiming to ensure more local authorities benefit from this scheme and to allow funding to be used on charging infrastructure for local authority-supported car clubs (Office for Zero Emission Vehicles, 2023).

The changes introduced are:

- ORCS will provide up to a maximum of 50% of capital expenses.
- Grants will be capped at £200,000 with a maximum of £7,500 per chargepoint.
- Charging infrastructure for the use of local-authority supported car club will be eligible for funding.

It is worth mentioning that the scheme provides financial support to local authorities, helping them deploy on-street charging points in residential areas, covering both rural and urban regions. The ORCS programme addresses this challenge by facilitating the installation of EV charging infrastructure on public roads and in residential neighbourhoods.

Working Charging Scheme (WSC)

As part of the wider options Tamworth might find suitable for their needs, the WSC provides an alternative route to fund the upfront expenses of the purchase and installation of the EVCP. Covering an up to 75% of the total expenses (inclusive of VAT), capped at a maximum of £350 per socket and 40 sockets across all the sites per applicant (Office of Zero Emission Vehicles, 2023).

The scheme has the potential to be deployed across the Tamworth, as it is open to public sector organisations, businesses, and charities. The WCS is run by the OZEV and administered by the DVLA.

It is important to highlight that the WCS only covers EVCP which is intended for staff or the fleet. However, it can be used by the local authority for its own fleet premises even if the fleet is yet transition to low-emission vehicles.

4. Establishing the Vision

The Staffordshire EV Strategy was produced in 2023, to assist the county's Net Zero goals and offer a preliminary evaluation of the infrastructure potential for EV charging.

To align to the Staffordshire EV Strategy, whilst achieving a focus on Tamworth, the same approach to the demand analysis is carried out with some key updates (highlighted below) to the datasets. The main goal of the demand analysis is to identify locations with a greater potential for EV usage and pinpoint crucial areas for chargepoint installation.

4.1. Methodology

The methodology consists of a spatial analysis by gathering and organising pertinent data into a geographic information system (GIS). GIS provides a unique ability to aggregate data and infer the kinds of trips people are making and the purpose of them. It is then possible to consider the number of trips that could be completed using an EV and the requirement for charging infrastructure. As part of the Staffordshire EV Strategy, GIS maps were customised for the districts and boroughs of Staffordshire, including Tamworth.

Propensity map

Based on a number of factors regarding adoption of EVs, the SCC analysis developed a profile of those residents most likely to be able to switch to EVs. Using specific SCC data, the first stage was to create a high-level demographic profile and travel behaviour of residents who are most likely to adopt electric vehicles. Residents with a higher propensity to use an EV across SCC were identified with the following characteristics:

Characteristic	High propensity
Age	25-54, the most likely to adopt new technology
Household income	£30,000, given the cost of new EVs
Household access to a car	Minimum 1 car, which supports a potential shift
Household employment status	Employed or a third-level student
Travel to work	20km or more
Mode share of car for commuting	Greater than 80%

Table 6 - Propensity characteristics

Subsequently, a matrix and a score system were developed to evaluate these various forms of information and pinpoint the areas with the highest concentration of potential EV adopters. Figure 13 outlines the outcome of the potential EV demand developed in the Staffordshire EV charging strategy.

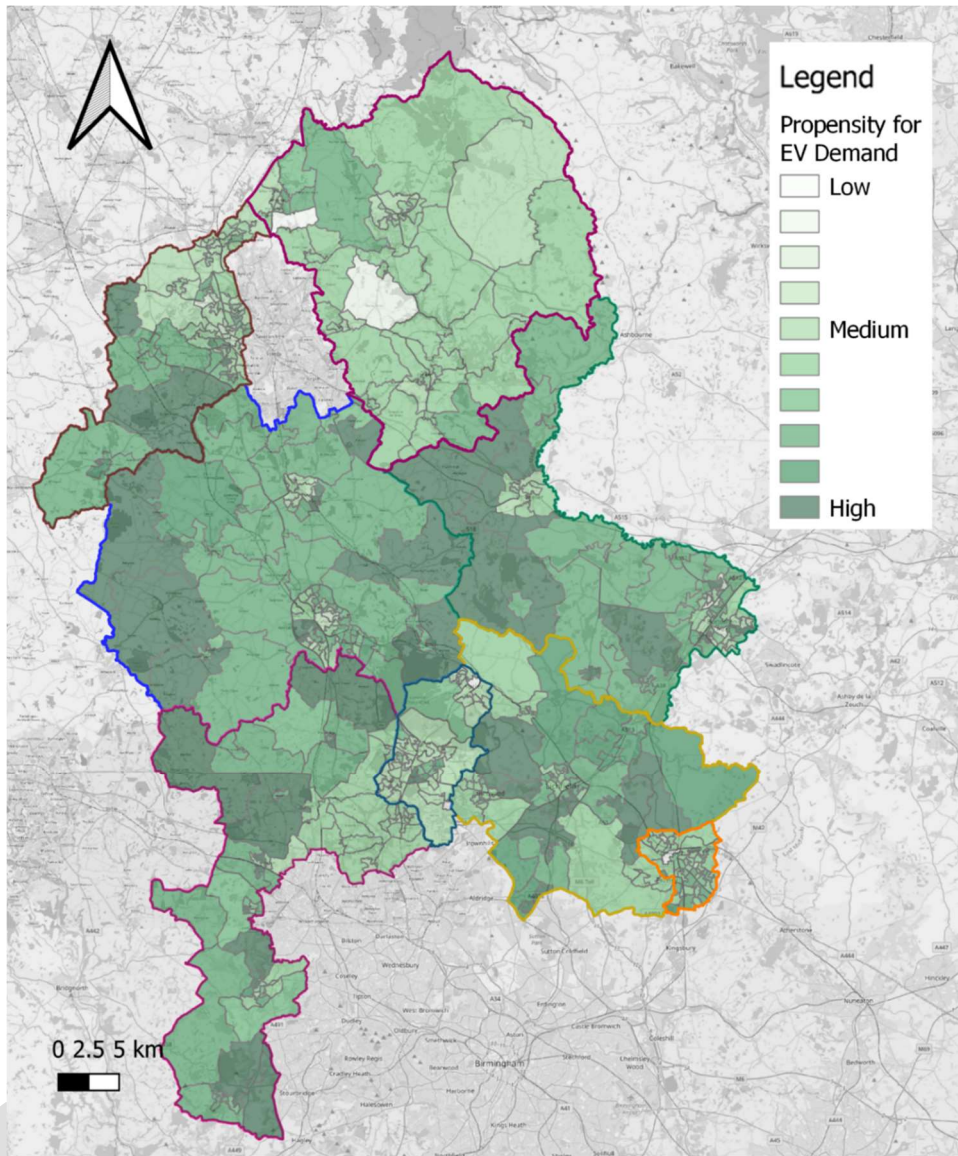


Figure 13 - Staffordshire EV charging propensity and proposed EV charging locations (source: Amey, [Staffordshire County Council Public Electric Vehicle Charging Infrastructure Strategy](#), Staffordshire County Council, 2023)

Combined assessment

Furthermore, more research was done to consider other journey statistics, point of interests and infrastructure throughout SCC. Specifically, a higher propensity to use an EV could be linked to:

Items used in the combined assessment	
Routes with number of cars commuting within Staffordshire	
Points of interest to identify potential destinations (updated for Tamworth)	
Infrastructure assessment	Network capacity map (updated for Tamworth)
	Car parks (updated for Tamworth)
	Land ownership
	Fuel stations
	Existing chargers

Table 7 - Combined assessment metrics

Finally, the propensity map of Staffordshire illustrating the districts and boroughs with levels of propensity to adopt EVs and the combined assessment are used to identify the suggested EV chargepoint locations and the type of infrastructure that will most likely meet demand.

Tamworth updates

Propensity maps and combined assessment are developed for Tamworth’s demand analysis using the same methodology described above and the results of the proposed locations for chargepoints are consistent with the Staffordshire EV charging strategy. The following maps have been updated to have a clearer understanding of the TBC area:

- Points of interest map provides a more granular and detail information on the type of attractors.
- Network capacity map includes the capacity of the National Grid substations in MVA.
- Car parks include information on available capacity from the grid.

It is important to note that the outputs of the demand analysis and the proposed location for chargepoints shown below are consistent with the results provided in the Staffordshire EV Strategy and the details of the successful LEVI funding application.

4.2. Tamworth Demand Analysis

Propensity map

The specific demand analysis for Tamworth can be extrapolated from the GiS developed for SCC. As explained above, the propensity map results from the combination of demographics and information on travel behaviour of people living in the 51 LSOAs. It is possible to see that the highest propensity is identified in Amington and in the southern part of the borough.

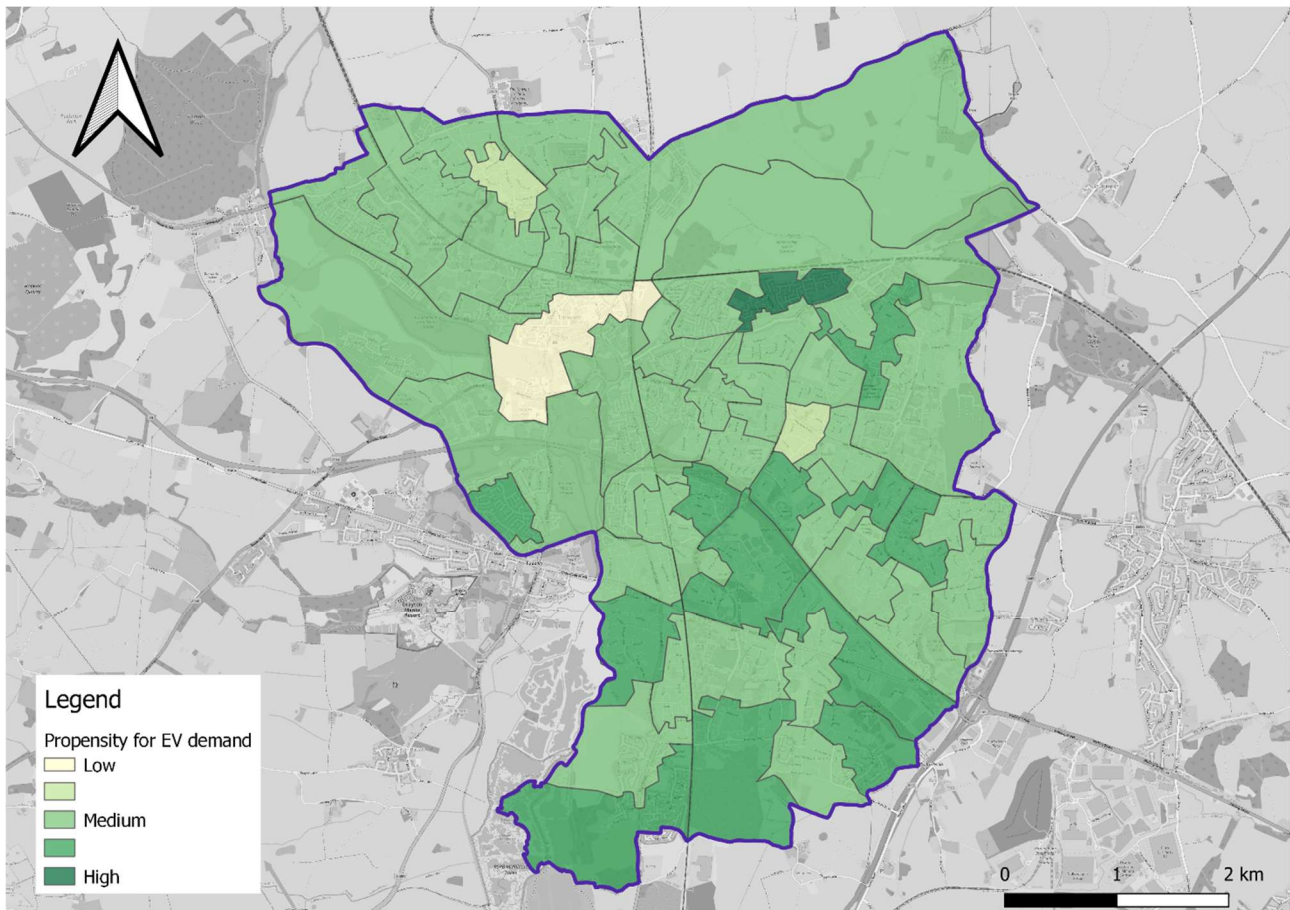


Figure 14 - Tamworth Propensity

Combined assessment

Focusing on the areas with high propensity from the propensity map, the combined assessment which includes information on routes of commuting by car, points of interests, network capacity and infrastructure allows for independent valuation of the EV charging location.

Commuting in Tamworth

The amount of car commutes throughout the borough is depicted in Figure 15. Instead of showing door-to-door travel, the data (sourced by the [Propensity to Cycle Tool](#)) provides general start and end points and a visualisation of routes with most cars for commuting. This information is indeed used to display the number of car-based commutes. During the analysis, these locations are considered the most likely affected by an EV transition and would consequently require the greatest number of charge points.

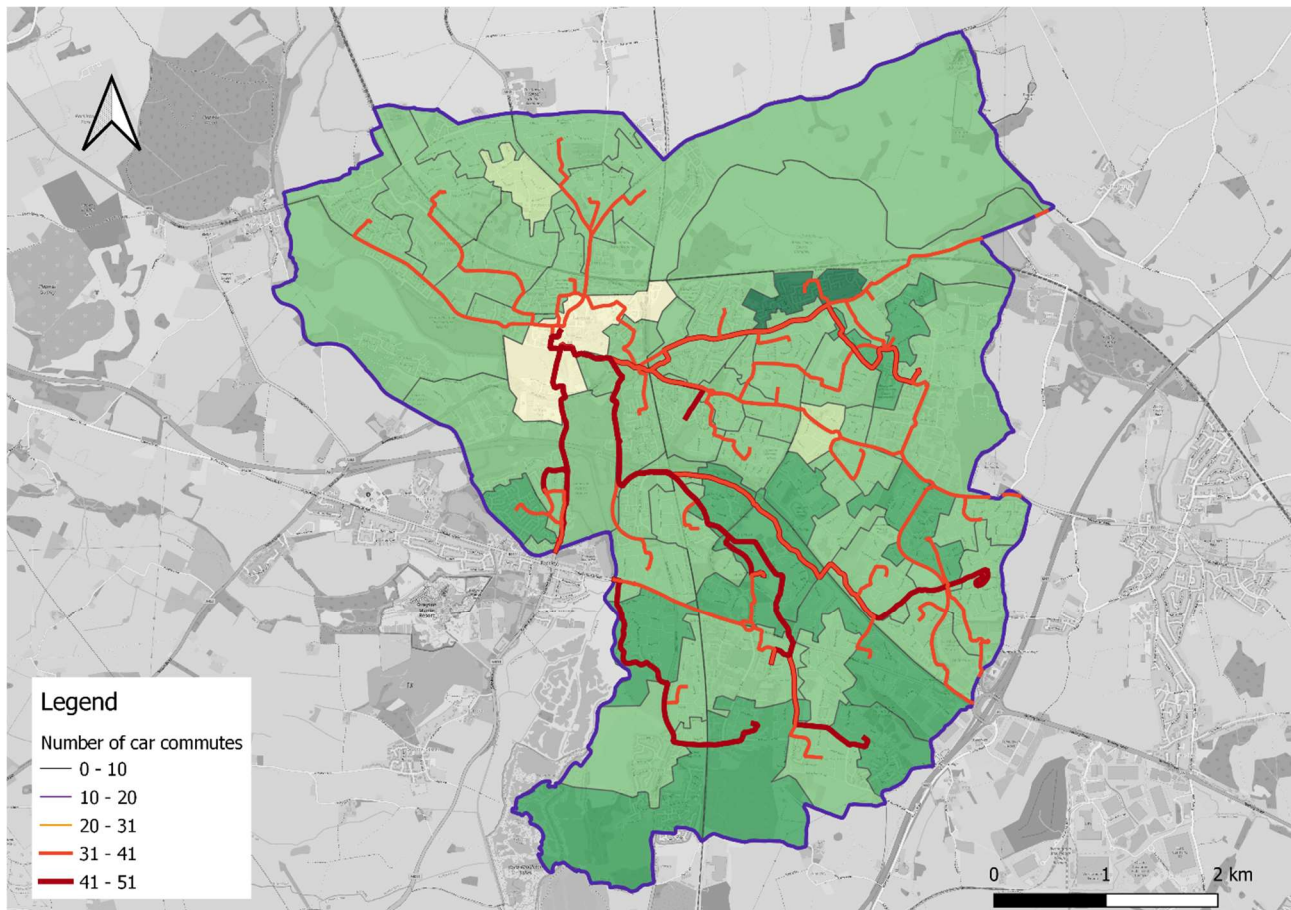


Figure 15 - Tamworth car commuting

Points of Interest in Tamworth

A selection of the mapped points of interest are displayed in Figure 16. Points of interest are mapped to identify potential trip attractors such as offices, supermarkets, industrial areas, and tourism destinations. The points of interest that were most expected to have a significant number of car trips were given a higher score (note that no real-time people movement data that would display the mode and destination was obtained).

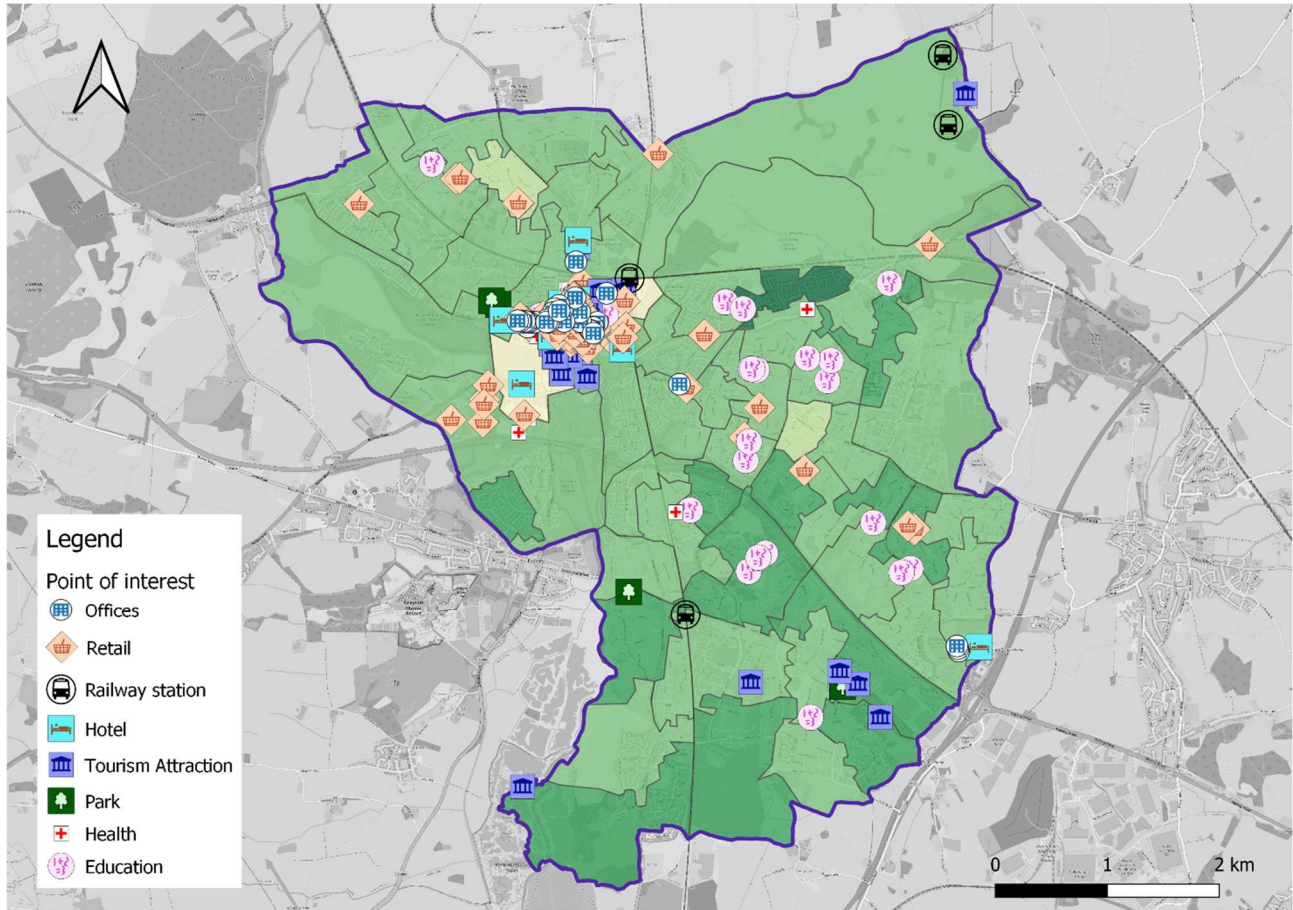


Figure 16 - Tamworth's points of interest

Substation capacity in Tamworth

Figure 17 gives an indication on the available capacity in 14 car parks in Tamworth town centre as per the static visualisation shown in the report provided by Tamworth Borough Council¹. This information is not available for the rest of the 18 car parks around the borough and should be investigated to help with location selection in the future. The figure also displays every National Grid sub-station in Tamworth, providing some insight into the locations of available power and potential capacity constraints. Considering the potential locations of hubs and rapid charging sites, the substation capacity might have a particularly significant effect on feasibility and cost of install, therefore the existing capacity should be discussed further with National Grid.

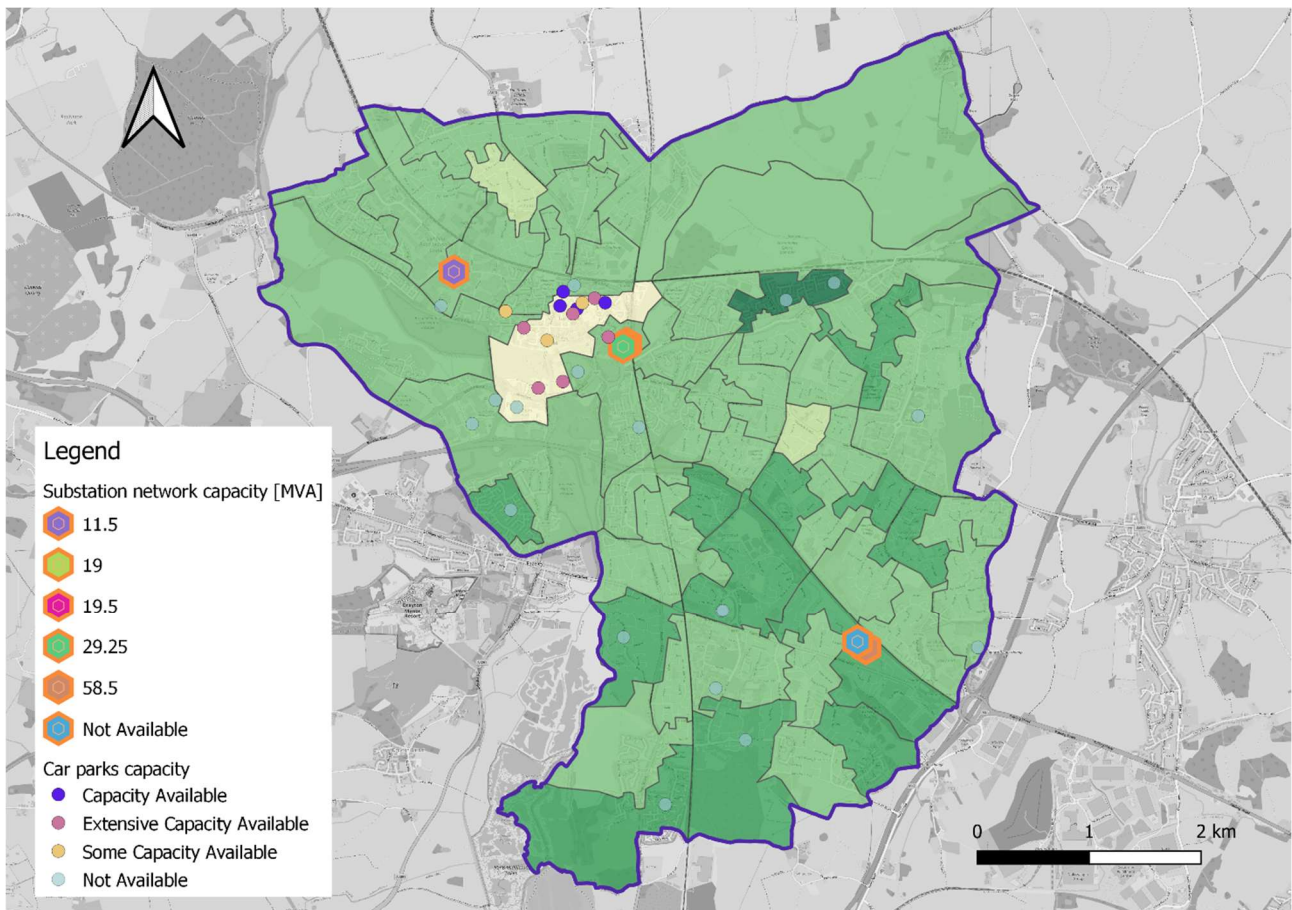


Figure 17 - Sub-Station network capacity

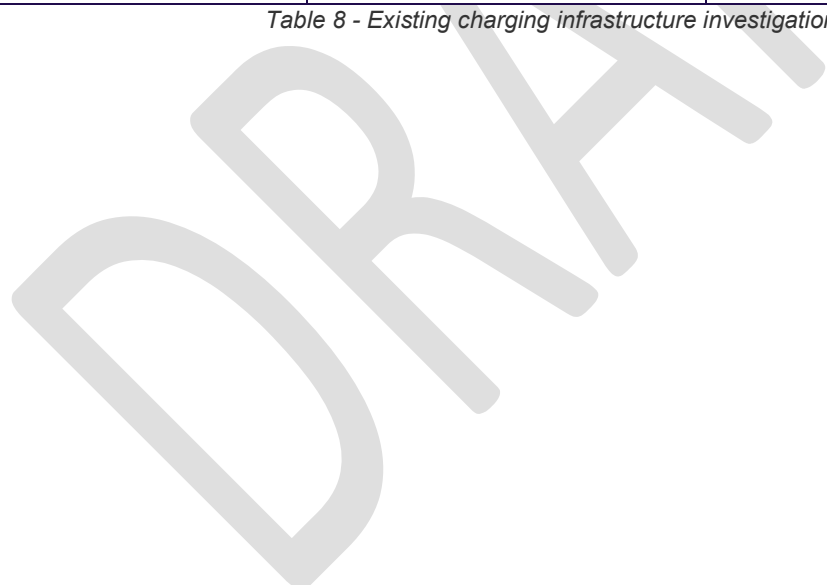
¹ Staffordshire LEVI Project, slide 15.

Tamworth - proposed locations

Following the methodology used for SCC, the propensity map and the combined assessment led to the proposed locations in Figure 18. At this stage, the existing infrastructure is examined to ensure adequate location for new charging points and to avoid any conflicts with existing provision. The location of the following types of charging infrastructure was investigated:

Charging infrastructure	Location type	Demand target
EV charging hub	Multiple chargers in the same location often with the opportunity to add other modes of transport or at transport hubs such as train stations	Depending on scale, it can support a community uptake in EVs or target high volume traffic routes such as the Strategic Road Network, to support longer EV journeys to or through the area
EV forecourt	Existing petrol stations	Support the provision of EV charging while there is still a need for petrol vehicles.
Residential off-street charging ²	Private residents with off-street parking	Support private car owners to switch to EV
Off-street charging	Charging in car parks both private and Council owned	Support destination charging

Table 8 - Existing charging infrastructure investigations



² In residential areas with limited access to private driveways, it is important to consider the possibility of installing [on-street charging](#) solutions to continue supporting residential private car owners' switch to EVs.

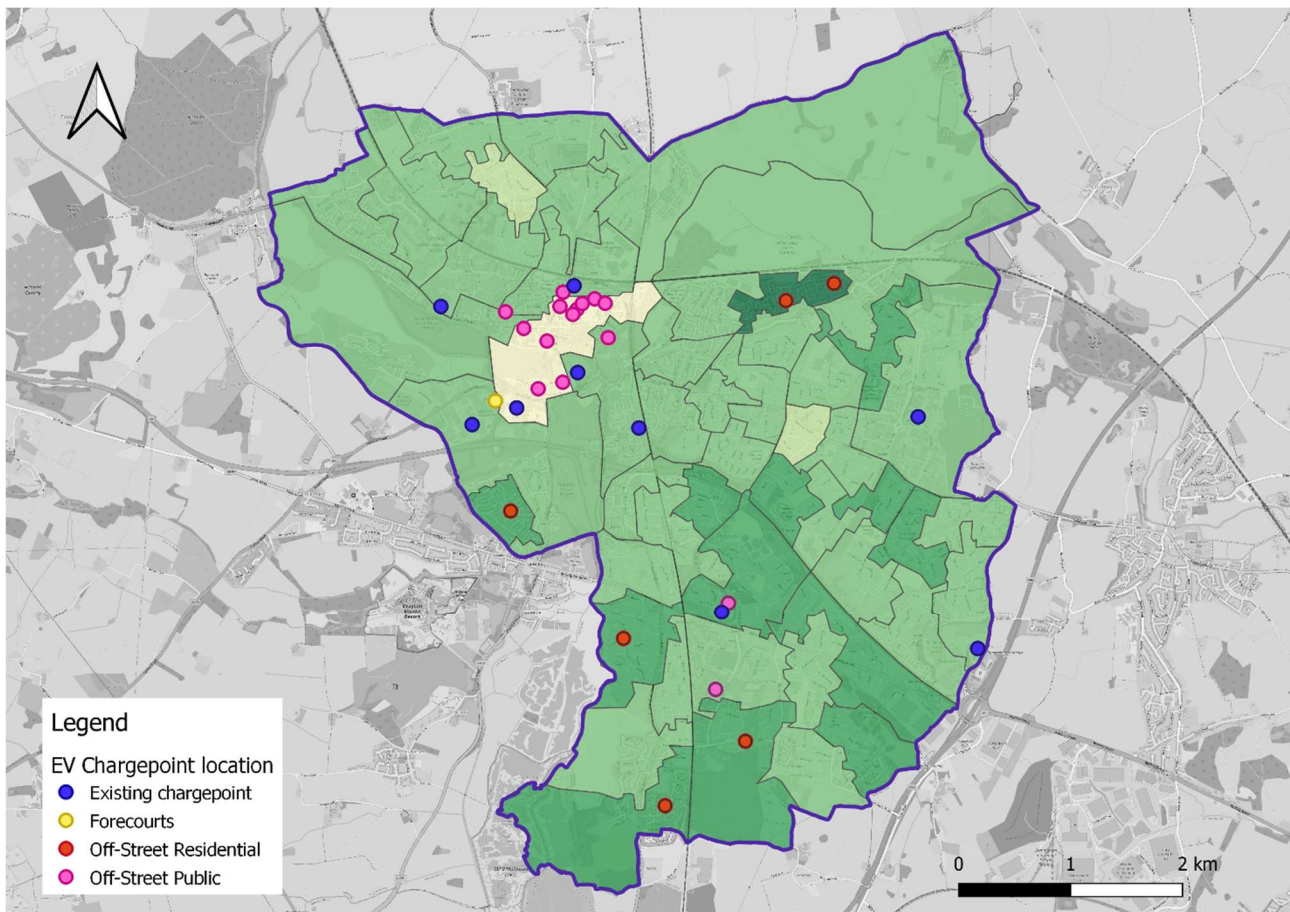


Figure 18 - Tamworth - proposed locations

Looking at Figure 18, it is worth noting that even though the demographics of Tamworth town centre suggest a low potential demand for electric vehicles among residents, it's important to consider the journeys to and from the town centre and the places of interest. The town centre could potentially serve as a location to charge en-route, meaning that chargepoint provision would still be necessary.

Furthermore, starting the conversation with private business, petrol stations, supermarkets, and retail parks to understand their intentions for supporting EV adoption would help inform the council's strategy to deploy chargepoints and ensure the equity of provision across the borough.

Off-street public charging stations in car parks provide an accessible option for EV owners who do not have the possibility to charge at home (29% of the population in Tamworth); nevertheless, the council must internally collaborate to identify which car parks would be best suited for provision.

To reduce the need for public-operated EV charging, incentives for off-street residential charge points, such as those on driveways, should be given priority. The council should also interact with residents and provide support when it can.

EV Charging Hubs were not located in Tamworth during the analysis across Staffordshire County. The rationale behind it can be attributed to the high costs of hubs, which can be justified when serving a large residential demand or high-volume traffic routes such as the Strategic Road Network, to support longer EV journeys to or through the area. However, if Tamworth wants to have several fast, rapid, or ultra-rapid charging stations placed in a single well-planned area, it is suggested to best pursue the hubs in collaboration with commercial operators who can support the development and ongoing management.

Moreover, it is imperative for the council to ensure the construction and advancement of EV charging stations in council-owned car parks.

To guarantee simple accessibility for the community and good coverage for the demand, the suggested charge point locations for public off-street car parks, EV charging hubs, and off-street residential areas should ideally be within a 1km radius.

Finally, the successful LEVI fund application sought to help SCC, TBC and neighbouring local councils scale-up local charge point delivery, allowing more residents, especially those without off street parking, to switch to EVs. The application outlined that 92,000 homes in the region are without off street parking and not within a convenient distance (determined as being 5 minutes' walk) of a charging point.

A high-level site identification exercise for Tamworth was submitted as part of the wider SCC LEVI application and so additional demand analysis, from a TBC context, may not be required. As an indication, 2,657 charging sockets has been forecasted to be installed across the County with installations anticipated as being between 2024 and 2028.

4.3. Key findings from demand analysis

The key findings from the demand analysis are distilled in this section. The Staffordshire EV Strategy recommended that the charging network should prioritise off-street residential and off-street charging locations, such as car parks. EV hubs can then be utilised to improve the overall network. It is assumed that the private sector will be responsible for installing chargepoints in EV forecourts.

The earlier analysis for SCC resulted in the development of an EV charging hierarchy (Figure 19) that considers factors such as propensity analysis and specific solutions that are suitable for the deployment of EV facilities. Whilst this analysis has focussed on the delivery of relevant, sustainable solutions, and considered the more local context in analysing demand, the hierarchy can be retained as this remains the most representative of the patterns found and needs anticipated in Tamworth.

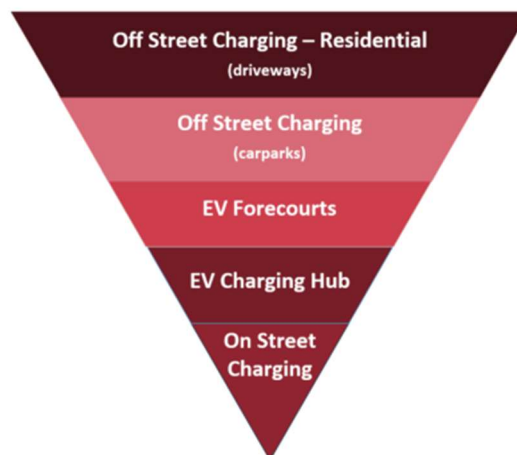


Figure 19 - Hierarchy of chargepoint solutions

The demand analysis for Tamworth outline that there is an opportunity to encourage the adoption of EVs across the borough using a range of chargepoint options. Consistent with the Staffordshire EV strategy, a similar approach would be recommended, focusing on initially the low-hanging fruit such as encouraging those with driveways to adopt EVs and home chargers, additionally new technology is allowing home chargers to serve the wider community.

Furthermore, council car parks can be targeted and repurposed to house chargepoints. It's worth noting that these car parks are situated in the town centre, which could provide convenient charging options for residents who lack off-street parking and en-route charging opportunities. In addition, to off-street charging opportunities for residents, on-street charging options should also be evaluated where appropriate which may be on a case-by-case basis depending on the area and street location.

Any efforts to promote EVs by TBC should align with the wider region's goals of prioritising sustainable transportation and reducing reliance on private vehicles.

Analysing the areas with a higher propensity demand for EVs which are predominantly located in the south of Tamworth, it is suggested that these areas could be best served through off-street resident chargepoint

options. Furthermore, points of interest in these areas should be explored to understand whether there are plans for chargepoints to be installed that could help serve the residents in the area.

To make informed decisions about where to place chargepoints and ensure transport equity across the borough, it's crucial to understand the demand for EVs and the current location of chargepoints. The proposed locations can help with this, but it's worth noting that the markers only indicate general areas, not exact locations.

In addition, it would be beneficial for the borough to consider the available network capacity when deciding where to place chargepoints. This would allow for the deployment of chargepoints in areas where network upgrades are not required, therefore keeping costs low. This consideration should be integrated into the planning process for future deployment.

As highlighted, it might not be practical at present to have charging stations specifically for en-route charging due to low demand. However, as more commuters and visitors switch to EVs, it is worth considering this option in the future.

When selecting locations for chargepoint installations, it's important to think ahead. By including plans for future expansion in the planning process, the necessary civil works and ducting can be completed in the initial phase, which will simplify the addition of more chargepoints later. This approach can also lead to cost savings for the council in the long run.

It is important to consider the residents living in areas where the predicted adoption of EVs is low. To promote the adoption of EVs in these areas, infrastructure should be targeted and developed to support these communities. This strategy should be integrated into the wider transportation plan, which should include public bus routes that are essential for serving these areas.

To promote the use of EVs in the Tamworth borough, a comprehensive selection of chargepoint options should be developed to instil confidence in the community. The council can start by deploying chargepoints in areas under their control, such as council-owned carparks. Engaging with key stakeholders, including local businesses, retail parks, supermarkets, leisure, and community centres, is also important to ensure equitable distribution of chargepoints throughout the borough and create an environment conducive to EV adoption.

To reiterate, TBC are not at the beginning of this demand analysis process. Significant work has been undertaken already to ascertain likely areas of demand, energy grid capacity and other success factors which might influence deployments. This was carried out both as part of the Staffordshire EV Strategy (as adopted by TBC's Cabinet in April 2023) and within the LEVI funding application. Ongoing collaboration with SCC is therefore needed to ensure objectives are met.

5. Recommendations

The local recommendations for Tamworth were specifically tailored to reflect the area's unique considerations, with the regional Staffordshire EV Strategy playing a significant role in their development.

Moreover, the successful LEVI funding application will establish several elements of TBC's anticipated delivery plan and so progress towards achieving these must be facilitated in collaboration with SCC.

▪ Engage the community

Engaging with key market stakeholders is crucial for Tamworth before deciding to deploy chargepoints. The council can use demand analysis to understand current and future EV adoption in the borough and determine the need for chargepoint provision. However, it's important to involve residents in the decision-making process to ensure their needs are considered. This will help gain community support and confidence for any future chargepoint provision.

Furthermore, it is important to involve stakeholders who have a stake in the provision of chargepoints, such as local businesses, retail, leisure, and community centres, to gain a comprehensive understanding of their upcoming plans for charging infrastructure. This information will assist the council in making informed decisions about the future and ensuring that the provision of chargepoints is evenly distributed throughout the borough to meet the needs of Tamworth residents.

NEXT STEPS

- Tamworth should reach out to groups that represent residents or go directly to residents to understand specific chargepoint needs in the area.
- In addition, Tamworth should engage with the business community to understand their EV ambitions, which can inform any future chargepoint deployment.

▪ Identify suitable locations

The demand analysis of the strategy (completed as part of the Staffordshire EV Strategy) helps identify the areas and the types of chargepoints that should be deployed in Tamworth. However, it is important to conduct additional feasibility studies to ensure that the chargepoints are deployed in the right locations to meet the necessary requirements and aid in the adoption of EVs.

To ensure that the chargepoints are deployed in the most appropriate locations and facilitate the adoption of EVs, it is essential to conduct a feasibility study that considers various factors such as user travel behaviour and site compatibility for charging. For instance, it would be advisable to assess council car parks to determine the best-suited location for charging infrastructure.

After identifying potential locations, additional assessments would be triggered, such as evaluating site network capacity, conducting civils feasibility studies, and capital cost requirements. These assessments would provide valuable information to determine whether deploying chargepoints in these locations is the right decision.

NEXT STEPS

- Within the areas identified for chargepoints from the demand analysis, prioritise and conduct further feasibility to narrow down the locations suitable for chargepoint infrastructure.

▪ Procurement

The procurement exercise will identify an appropriate partner for the delivery of chargepoints in Tamworth. Initial market engagement should be conducted with chargepoint operators to further understand their offering and potential commercial arrangements based upon the sites identified through the feasibility analysis.

Choosing the right commercial strategy is a vital part of assessing the potential impact of the future chargepoint network in Tamworth, as well as the associated risks and responsibilities. The council must work with relevant parties in procurement and Councillors members to determine the preferred approach that aligns with the council's broader objectives.

To ensure the successful deployment, operation, and maintenance of chargepoints in the area, suppliers should be put to the test during the procurement exercise. It's necessary to evaluate their ability to meet key performance indicators, such as chargepoint uptime, and ensure that the chargepoints are accessible to all users.

NEXT STEPS

- TBC should conduct initial market engagement as part of the procurement process to further understand the chargepoint provider landscape and how they can best serve the community.
- Utilise the initial market engagement to develop a Tamworth specific procurement specification to go out to market with.

▪ Chargepoint operators (CPOs)

It is important for Tamworth to consider the consequences of selecting either one or multiple CPOs. The advantages and disadvantages of each approach are likely to be comparable whether Tamworth chooses to act independently or alongside the other district and borough councils across SCC. Multiple providers may be required where specific on-street deployments such as gully or lancet type charging is the preferred route.

NEXT STEPS

- Engage with CPOs to ensure they follow best practice and encourage charging solutions at locations tailored to the requirements of each area, for the benefit of the whole population. Note, this should also be a part of the initial engagement during procurement.

• Monitoring the chargepoint network

To ensure that the public has trust in public chargepoints and that the network is successful, it is essential to monitor their performance closely. Tamworth should create a monitoring system that assesses the progress of chargepoint provision and communicates it both internally within the Council and to the public when relevant. Tamworth would be responsible for determining which metrics to monitor and who to share them with.

The selected chargepoint management system could help support this process and provide the necessary data required to monitor the network. By being transparent about the network's performance, it can help to build trust and demonstrating progress towards clear goals will show a commitment to these objectives and may encourage greater public adoption.

NEXT STEPS

- Develop a network monitoring system that incorporates key performance metrics. The selected chargepoint management system should be engaged as part of this process.

As a component of the county strategy, additional materials were created to aid in the implementation of chargepoints. The following resources will be just as vital for the local plan.

EV Toolkit: The county council has a toolkit (SCC, 2021) that includes important information about owning and operating an EV, which is available on their website for public use. Tamworth should refer users to this resource as needed.

EV Charging Action Plan: This document sets out all the steps required and allows the capability to track and manage each EV charging project. The developed EV Charging Action Plan should be adopted and implemented as part of Tamworth strategy to deploy chargepoints.

5.1. Other considerations

In addition to recommendations detailed above, the following actions should be considered to further facilitate the deployment of chargepoints and encourage the adoption of electric vehicles.

▪ EV demonstrations and access

To encourage the adoption of electric vehicles and make deploying chargepoints easier, targeted engagement with different user groups is crucial. These groups include retail estate owner/operators, large-scale employers, young people, elderly individuals, commuters, and people living with disabilities. Overcoming the various obstacles around electric vehicles and charging infrastructure is essential, and one way to do so is by providing users with firsthand experience and demonstrations. CPOs and vehicle manufacturers could lend their support to this initiative, which would ultimately benefit Tamworth's overall approach to providing for the borough and address key public concerns.

- **Charging infrastructure trials in specific locations**

Tamworth may consider deploying chargepoints with incentives for users on a trial basis, such as offering free or discounted charging, to jumpstart the demand for electric vehicles. Alternatively, they could utilise temporary infrastructure by making use of the available portable chargepoints on the market. This approach would allow users to gain first-hand experience and build confidence in the technology.

- **Encourage private sector buy-in**

To facilitate the use of EVs among employees at local businesses, workplace charging will be necessary. A viable approach is to establish a framework that allows for the deployment of standardised charging infrastructure. Businesses can also take advantage of the Workplace Charging Scheme grant to fund the installation of chargepoints. Furthermore, should be encouraged to implement an EV first policy for company cars as part of their sustainability goals, which can incentivise staff to adopt EVs and have a known affect across the wider community.

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