energy saving trust

CITY OF YORK COUNCIL

City of York Council
Public EV Charging Strategy
2020 - 2025

Setting out our approach to a public charging network for electric vehicles

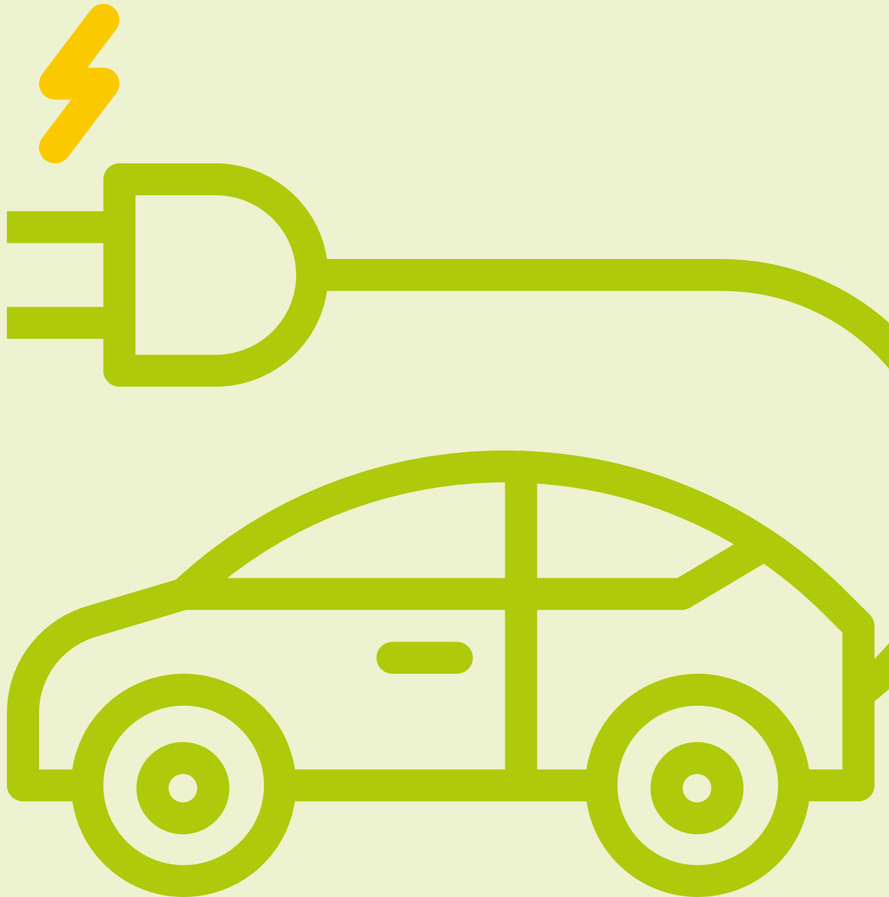
Foreword

York is a pioneer in electric vehicle (EV) charging, installing one of the first public systems in 2013. This Strategy reaffirms our commitment to provide a high quality public network that supports and accelerates the transition to EV, whilst maintaining a fair tariff structure.

To guarantee the best result for residents, we will continue to directly own our charging network. This allows us to plan how the network will grow, set tariffs, makes us directly accountable, and enables us to deliver next generation chargers as quickly as possible. We think this is the best way to approach an issue that we recognise is key in enabling the decarbonisation of road transport.

We have chosen a 5 year term as this enables us to plan with a level of certainty and ensures that we are focused on delivery. This removes the distraction of future gazing and lets us get on with delivering action on the ground.

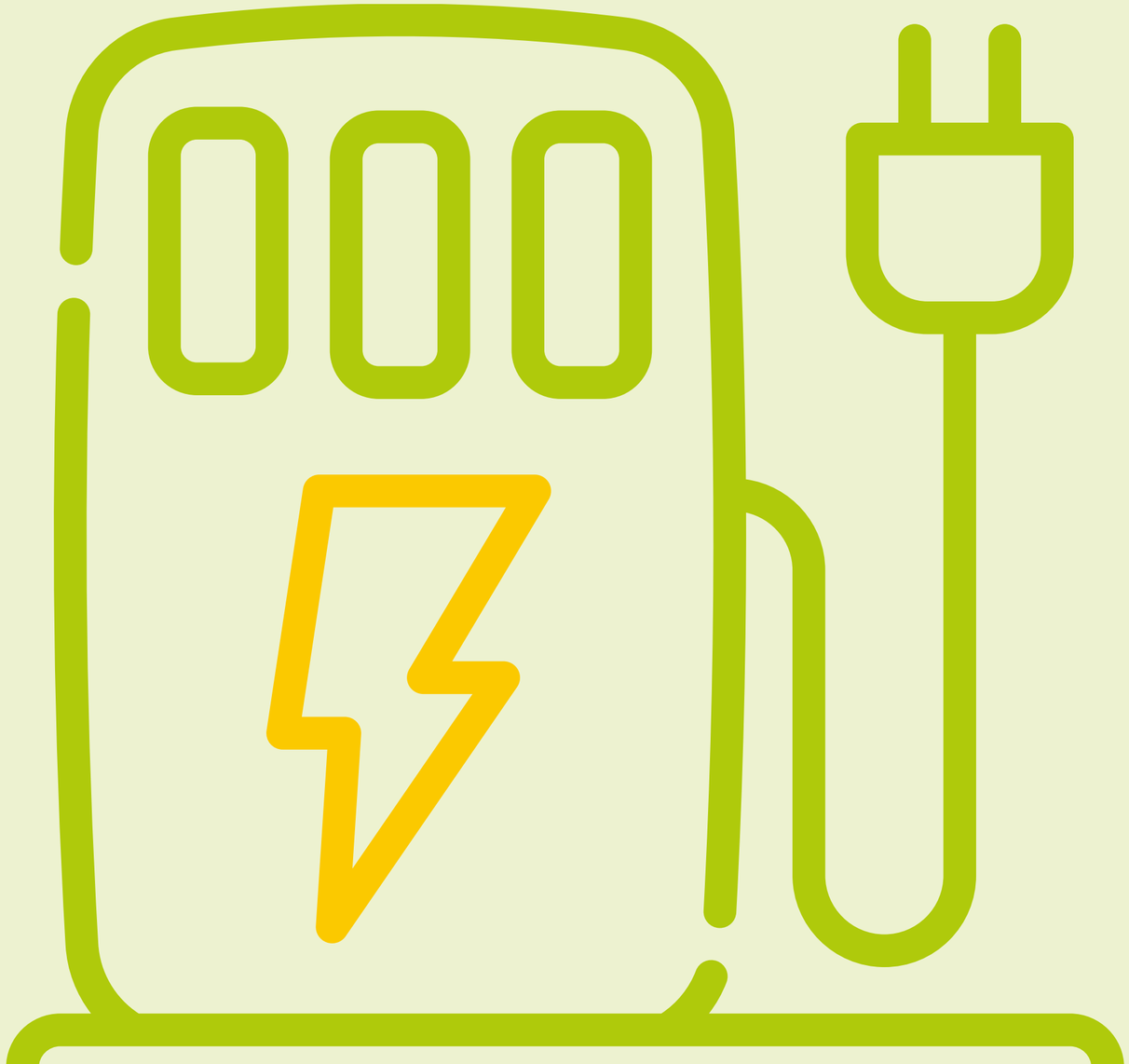
We would like to thank the Energy Saving Trust for their expert advice during the development of this strategy from the Local Government Support Programme (funded by the Department for Transport)



How did we get here?

City of York Council has provided a range of public charging infrastructure for electric vehicles since 2013. There has also been success in seeking funding for HyperHubs at two of the Park and Ride sites.

We continue to believe that the Council is well positioned to provide a charging network that supports the transition to electric vehicle usage but recognise that there are a number of areas that require improvement.



Why is the Council involved in electric vehicle recharging?

Local Authorities are uniquely positioned to provide strategically located charging infrastructure that will support residents, commuters, fleets and through traffic to conveniently and affordably recharge electric vehicles.

By maintaining ownership of a core network we can set user tariffs ensuring that we have control over one of the critical factors in delivering a charging network for all. We are also able to deliver next generation Ultra Rapid facilities that currently have a challenging business case for commercial providers, guaranteeing access for York to next generation infrastructure at the earliest opportunity.

By providing high quality facilities we will support the adoption of electric vehicles with associated air quality and Climate Change benefits. We can also do this whilst ensuring that electric vehicles fit within the Council's wider transport objectives of maximising active travel and minimising private vehicle usage.

What could we do better?

When we developed our EV charging network in 2013, there were far fewer plug-in vehicles on the road and there was more uncertainty about what public infrastructure would be required. Our network is made up of 20 Fast chargers (40 sockets) and 5 Rapid chargers which was enough in 2013 to make it easy to find an available charger. Rapid chargers were mostly installed to support the electric bus network which means that the location of some of our Rapid chargers needs reassessing.

In 2014 there were 1,510 charging sessions, by 2018 that had increased to 13,695 which explains why users find it difficult to access available chargepoints. The demand for charging is in spite of the network being limited to four City Centre car parks and five sites on the ring road which aren't convenient for everyone. All of our City Centre sites are now regularly full. As a result we now need to develop a network that meets the needs of the next generation of plug-in vehicles which have different charging capabilities and will be available in much larger numbers.

For the network to be attractive to users, as well as the number, type, and location of chargers it is also essential that the network is reliable. During 2018 and 2019 we encountered significant reliability issues.

We now understand what caused these problems and have taken short term action to resolve the issues. This Strategy is our long term response and will ensure that the network is reliable going forward. We have identified the following key issues:

- Part of the reliability issues are due to being an early adopter of public charging equipment. Much of the estate is now life expired and some of the chargepoints have 3 pin sockets which are no longer appropriate.
- This was compounded by a lack of maintenance, which made the equipment more likely to fail and meant that we didn't have a way to fix issues in a timely manner.
- The lack of adequate maintenance was due to the network lacking a clearly defined budget which makes maintenance and renewal challenging.
- Management of the network needs to be streamlined to ensure that faults are identified and fixed in a timely manner.

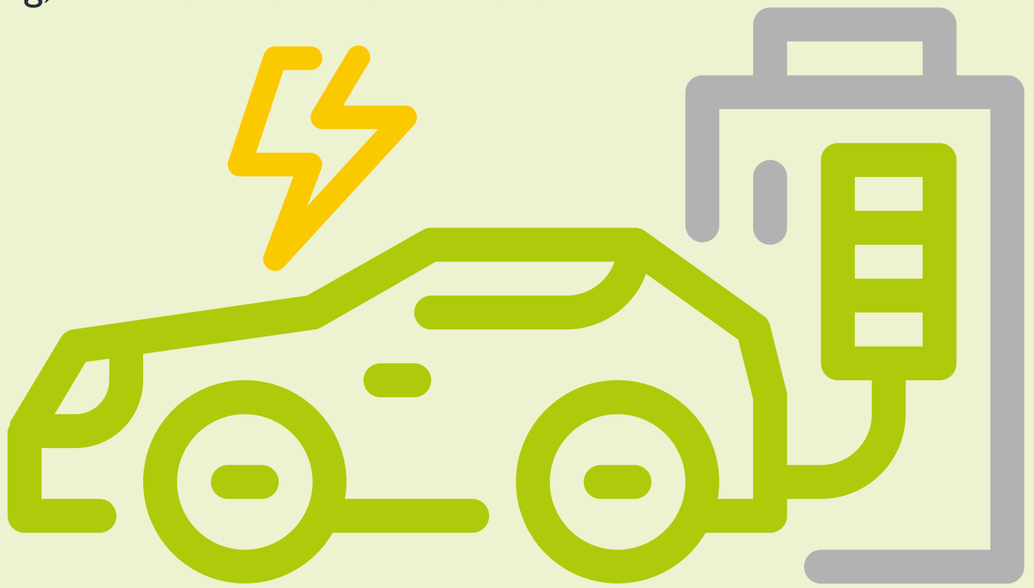
The Council lacked capacity to oversee the development of the network. A single officer was responsible for the network which led to a single point of failure when they left the Council.

Where are we going?

We have the advantage of having gained significant experience since 2013 through the City of York network.
We know what we need to put right to put York back at the front of public charging, and this is how we will do it.

Opportunities

- We own and operate a number of car parks within the City providing ideal locations for Fast charging
- We are developing next generation 150 kW ultra-rapid HyperHubs at strategic locations to provide the shortest possible recharging times for compatible electric vehicles. Thanks to funding from Office of Low Emission Vehicles and European Regional Development Fund which largely covers the cost of building our first two HyperHub sites, and an innovative design including on site solar electricity generation and energy storage, we will be able to maintain a lower tariff than commercial operators for Ultra Rapid chargers
- We are committed to providing competitive tariffs for recharging by keeping the tariff as low as possible
- We are well placed to consider the location, type and number of chargepoints in the context of current and future development plans
- We will deliver a network that complements commercial networks to provide choice and scale of charging options within York.



By providing a first class charging network we will encourage Plug-in Hybrid and EV uptake providing Climate Change and Local Air Quality benefits.

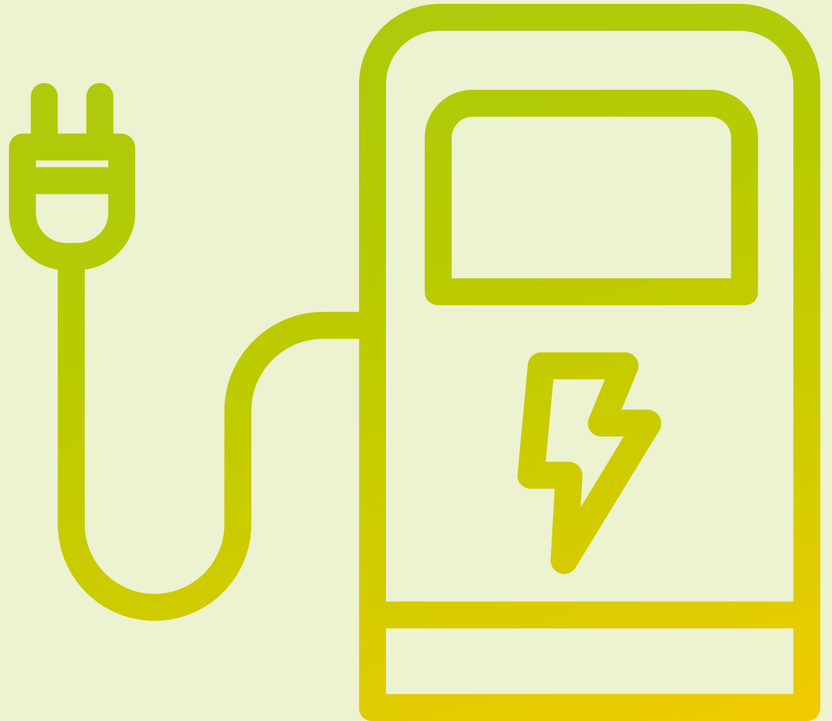
A solution to charging for residents without off street parking is needed. On street charging is a complicated issue which is detailed in Annex A. At this time we don't see a role for on street charging as part of our network, but if the problems outlined in Annex A are resolved we will consider this.

What type of chargers are there?

There are different types of chargers that suit different charging demands. Fast chargers are suitable for all day charging. We put these in long stay car parks as this is where people are parked for several hours. We have 40 Fast charging bays in York. We need more of these. Fast chargers can be used by pure electric and plug-in hybrid cars.

Rapid chargers are for pure electric cars. Most plug-in hybrid cars can't use rapid chargers. Rapid chargers will charge a pure electric car in 30 – 90 minutes. We have 5 Rapid chargers in York.

Ultra-Rapid chargers are a new type with higher power output. New electric cars can increasingly use ultra-rapid chargers, so they are needed to support the next generation of EV's to recharge as quickly as possible which will encourage more people to buy EV's. These can charge a pure electric car 3 times faster than a Rapid. We have an OLEV/ERDF project in York to build 2 charging hubs with Ultra-Rapid chargers – we call these HyperHubs. We have the funding for these sites secured and have gone out to tender to build them. We need extra funding to deliver a third site.

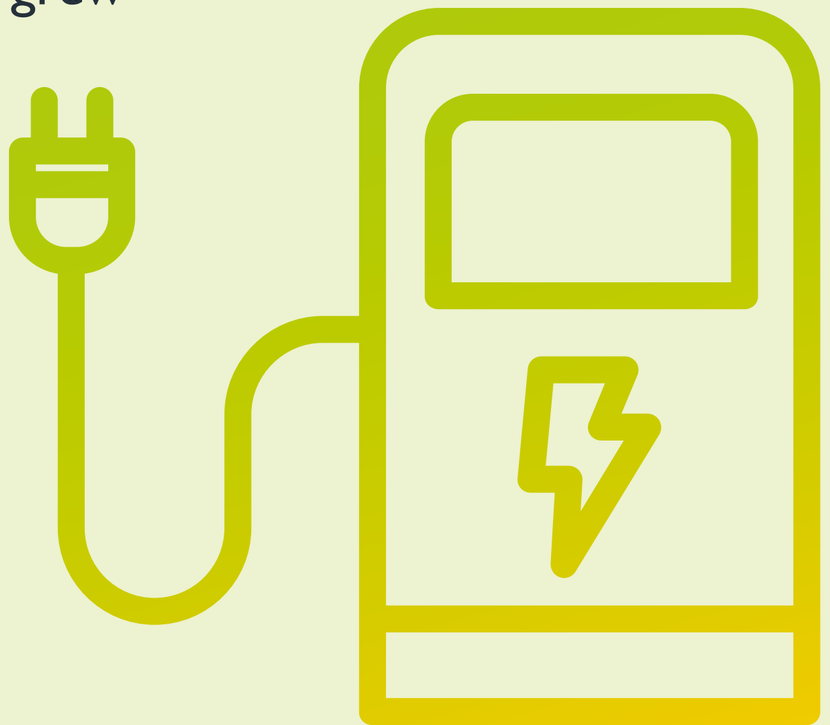


Why invest in Rapid and Ultra-Rapid chargers?

We know that we need more Fast chargers, and that these are particularly important for Plug-In hybrids, but we also recognise that we need more Rapid chargers too. Rapid chargers are more expensive to install but are becoming increasingly important for pure EV users.

National data such as the User Survey undertaken by ZapMap, shows that the demand for Rapid chargers is growing more quickly than for Fast chargers. ZapMap found that in 2019 the number of Fast chargepoints grew by 27% but the number of Rapid chargers grew by 43%, reflecting increasing demand for more powerful chargers. The amount of time that users spend at Rapid's is also increasing as bigger battery sizes become more common.

This is reflected by data from the York Network where we also see demand for Rapids growing more quickly than Fast chargepoints, which is why we are investing in additional units.



Will the Council network be the only option I have for public charging?

No, we see the role of the Council's network as providing a core service that guarantees EV charging facilities are available to support the ambitions of this Strategy whilst maintaining the ability to set as low a tariff as possible. We aren't setting out to be the only provider of charging facilities in York. We think this would be bad for consumer choice, and it would limit the rate at which chargepoints could be added, holding back EV uptake.

To stimulate the market we have recently increased the requirements for chargepoints in new developments by requiring Fast chargepoints in 5% of car spaces, or a lesser number of Rapid chargepoints where appropriate. This will provide more opportunities for charging at destinations and will complement the Council's investment in Council owned long stay car parks.

In addition we are aware that a number of businesses, including Supermarkets, have signed deals with chargepoint operators which will see chargepoints becoming a standard part of their offer regardless of local planning conditions.

We are supportive of commercial networks and have seen investment from several operators including Rapid chargers from Polar Network and Instavolt and Fast chargers on the Zero Net, LiFe, PodPoint and Tesla Destination networks. These are welcome additions and support consumer choice, geographical spread and enhanced rollout rates. Commercial operators will continue to be free to set their own tariffs to support their businesses cases to roll out additional chargepoints as fast as possible.

What does the user tariff pay for?

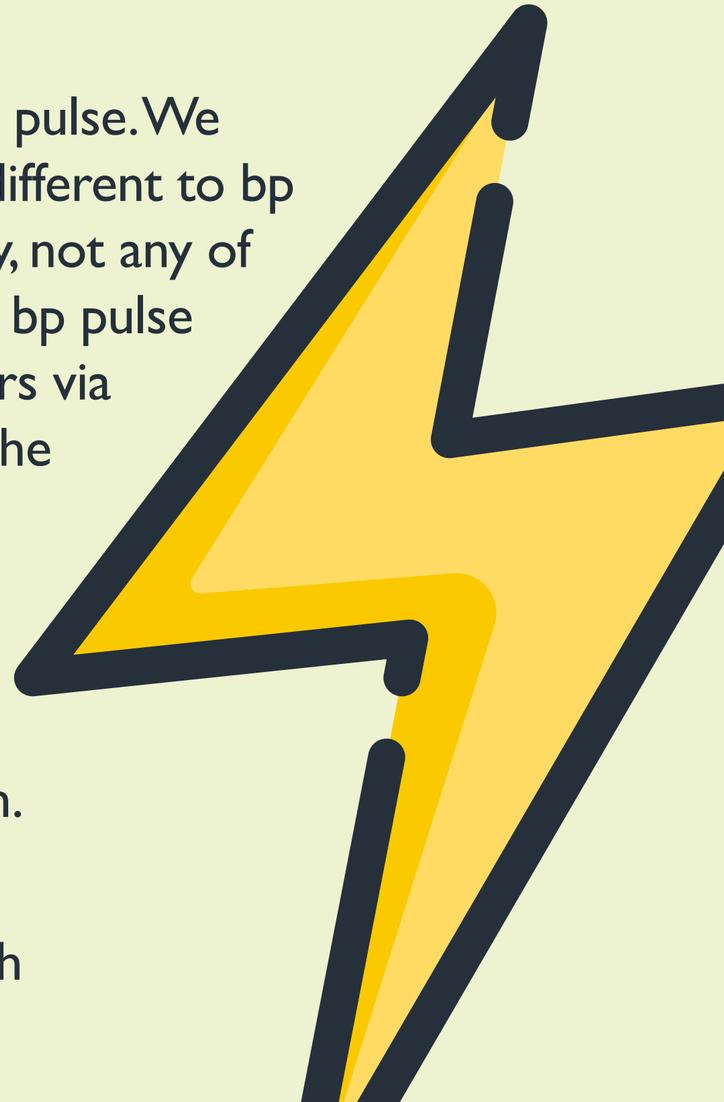
We believe that the fairest way to provide a charging network is for users to pay a tariff so that day to day operation of the network is funded by users. The first thing that the tariff pays for is electricity. However we also pay a fee for using the Charge Your Car or Polar Network, a banking fee, and a merchant fee.

The current tariff is 15 p/kWh and this has been in place since 2013. Since then electricity prices have increased and now, according to uSwitch, the average household in York will pay 16.5 p/kWh for the electricity used in the home. For 2020/21 we expect to see an increase in that figure. However once other fees are included (such as standing charges and admin fees) the real figure is 20 p/kWh. It is possible for customers to access cheaper deals, and EV tariffs are available where customers pay a much lower fee at night (to encourage overnight EV charging) and higher fees during the day, but 20 p/kWh is representative for customers on a standard tariff.

What will the new tariff be?

- To make sure that we can deliver a modern and reliable network we need to increase the user tariff. We will continue to make our tariff as simple as possible so there is no connection fee, users just pay per kWh.
- From 2021 we are transferring our access partner from Charge Your Car to bp pulse. We remain an independent network with our own tariffs, so our tariff structure is different to bp pulse. Whenever you use a City of York Council charger, the York tariff will apply, not any of the bp pulse tariffs. Users can access our Network without subscription via the bp pulse app, guest payment on the bp pulse website, or at Rapid and Ultra Rapid chargers via contactless payment. Subscribers to the bp pulse network can additionally use the bp pulse RFiD access card but will pay our standard York tariffs.
- For 2021 our tariffs are 20 p/kWh for Fast chargers and 25 p/kWh for Rapid and Ultra Rapid chargers.
- At Rapid and Ultra Rapid chargers that accept contactless payments (contactless bank card, Apple Pay, Google Pay), the tariff will be also 25 p/kWh. i.e. we will not charge any additional fee for card payments.

All electricity for the options above originates from the Council contract, which purchases renewable energy.



Will I pay for car parking?

Since 2013 EV users haven't paid parking fees in charging bays, instead at Fast charging bays users have received up to 12 hours of free parking as long as they are plugged into a charger. This has some unintended consequences where regular users plugin to get free parking even if they don't need to charge.

This creates 3 main problems –

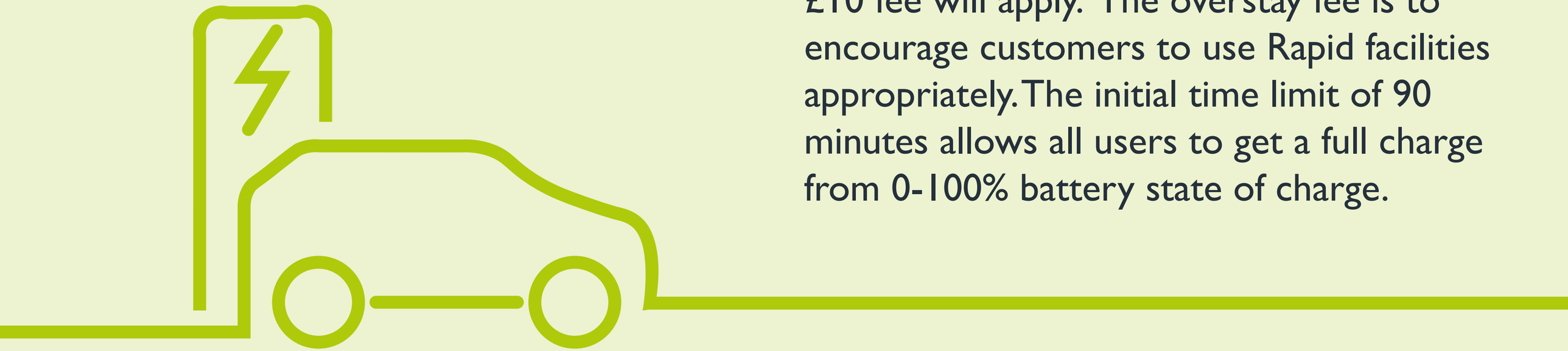
1. Users who do need to charge their vehicles can't access a charger.
2. The Council loses out on charging fees which pay for the running of the network.

The Council forgoes parking revenue which makes the case for increasing the number of chargers more difficult.

We have examined a number of options to move away from free parking.
Scrutiny Committee considered these options and recommended the following:

Fast Chargers

Fast bays – **Normal parking fee applies**. Users can stay as long as they like as long as they pay for parking and are plugged into a charger. Users will continue to pay the normal network fee for charging.

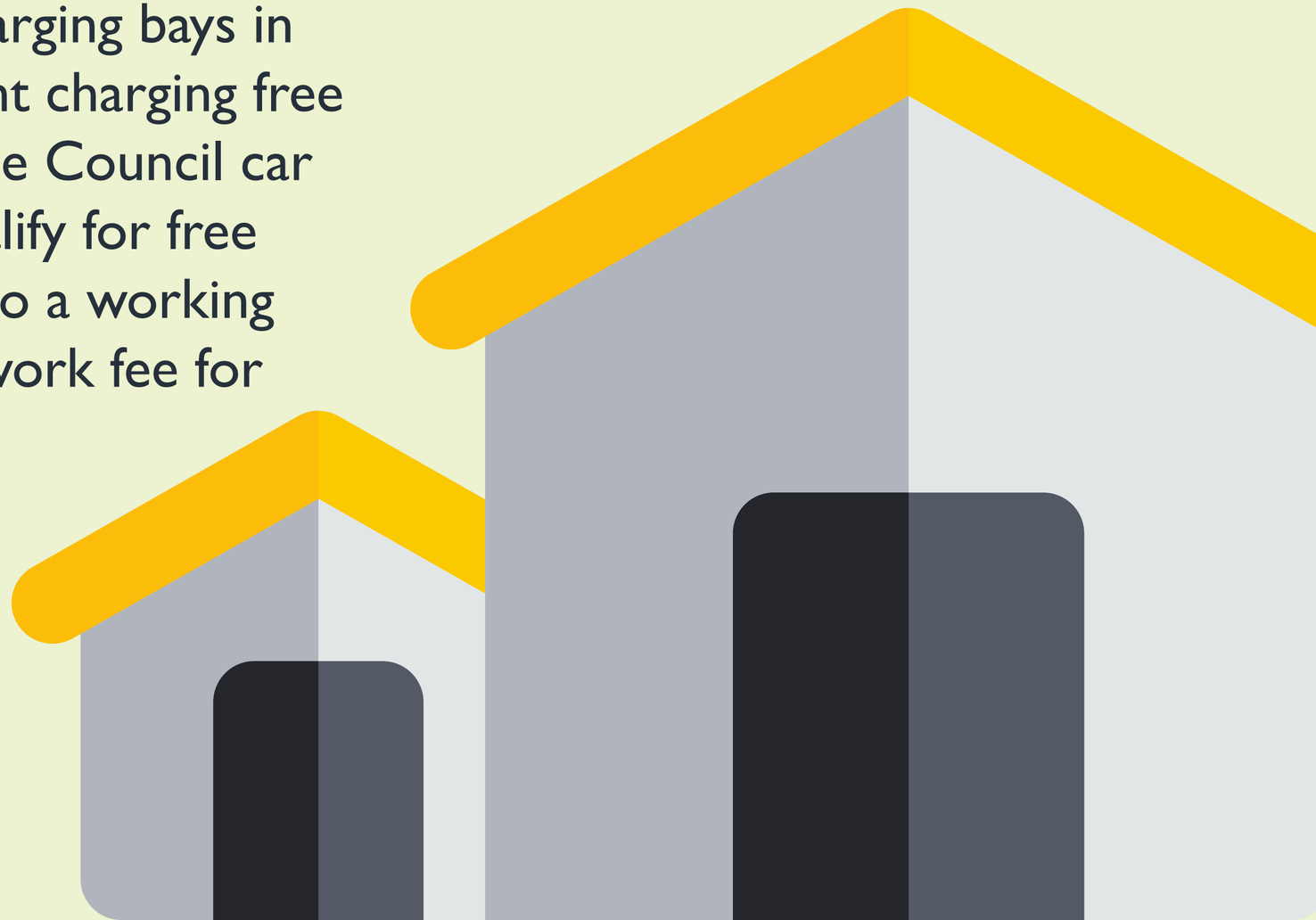


Rapid/Ultra rapid

Rapid / Ultra Rapid – **No parking fee** (free). An **overstay charge will apply**. After 90 minutes an additional £10 charge will be applied by Charge Your Car / Polar Network. For every additional 60 minutes a further £10 fee will apply. The overstay fee is to encourage customers to use Rapid facilities appropriately. The initial time limit of 90 minutes allows all users to get a full charge from 0-100% battery state of charge.

What about overnight parking for residents who can't charge at home?

For residents who can't charge at home, such as the cases in Annex A, we will make Fast charging bays in Council car parks available for overnight charging free of charge. Any resident can apply to use Council car parks free of charge overnight – to qualify for free parking the vehicle must be plugged into a working charger. Users will pay the normal network fee for charging but no parking fee will apply.



By implementing this Strategy we will:

- Keep residents, businesses and visitors engaged and consulted on future measures and charging types and locations and promote the benefits of EV adoption of EV usage.
- Deliver a reliable network – we want to renew the existing hardware to bring it up to modern standards and to improve reliability.
- Ensure that supply of chargepoints matches demand and provide managed over provision (a right sized network) to provide a good customer experience whilst maintaining a financially sustainable network – revised City of York Council planning guidance requires 5% of parking spaces to have a chargepoint. This applies to car parks associated with a planning application but we will aim to meet this requirement across our charging network. The requirement is based on an assessment of likely demand over the next 5 – 10 years.
- Ensure that bay blocking is discouraged whilst striking a balance for legitimate commuter charging – principally this applies to 7 kW chargepoints where we have historically offered 12 hours free parking whilst charging. We will continue to offer free parking while a vehicle is charging.
- Match power output of chargepoints to dwell time so that the right type of charger is available at the right location.
- Ensure that residents without off street parking are able to access reliable public chargepoints at a reasonable cost through the development of an enhanced Fast charger network and the HyperHubs. Enhancing the Fast network includes looking at how we can provide overnight charging opportunities in public car parks that are close to residential areas without off street parking.
- Clearly define management responsibility and agreed uptime requirements.
- Ensure that the network is adequately funded to enable effective maintenance, and when required expansion and renewal of chargepoints – this includes increasing the standard tariff to 20 p/kWh for Fast chargers and 25 p/kWh at Rapid and Ultra-Rapid.

By implementing this Strategy we will:

- Complement commercial networks to provide a wide choice of publicly owned and privately owned networks to maximise coverage and choice for users. We will try to engage with commercial networks to understand their plans for additional chargepoints.
- Set standards for bay markings, size of spaces, and signage so that a consistent approach is rolled out. A rule of thumb at present is that three conventional parking bays are needed for two EV charging bays to enable safe attachment and operation of charging cables.
- Commit to accepting bank card payments at Rapid chargepoints as soon as possible. If we change the hardware all our new Rapid chargers would have this facility as required by legislation.
- Enable free vend in the case of a communications failure between the chargepoint and the back office. This enables users to continue using chargepoints when communication with the post is lost, tariff free. It doesn't apply to connection issues between the users' device and the chargepoint/back office i.e. users' mobile phone failure.
- We will deliver a differentiated network that meets the different needs of residents, commuters, through traffic, plug-in hybrid and full EV. This will be achieved by an enhanced Fast network supported by HyperHubs.
- Funding – the day to day operation of the network will be funded by user tariff not by non EV owning residents or indeed the 26% of households in York who own no car. For significant investment into the network we will look for a balance of Council funding and grant funding. We will investigate alternative sources of funding such as selling advertising space at chargepoint locations, if this is appropriate and in line with planning requirements.

When we will do it

2019

- Improved the Council's internal management of the network resulting in a dramatic improvement in reliability going from 50% to 100% of chargepoints being operational.
- Members invested £25,000 of revenue budget to the repair and maintenance of the existing EV charging estate.
- Secured funding for the HyperHubs project and sought funding to expand the Fast charger network.

2020

- Publish EV Charging Strategy
- Open two HyperHubs, providing 16 charging bays, 8 Rapid and 8 Ultra Rapid. HyperHubs are part funded by Office for Low Emission Vehicles and European Regional Development Fund.
- Renew the existing hardware to transform the reliability of the chargers
- Enable bank card payments at Rapid and Ultra-Rapid chargers
- Put in place a new maintenance agreement
- Implement minimum 95% uptime target for chargers in the Council's network whilst aiming for 99%

2020 - 2023

- Commit to setting a standard tariff of 20 p/kWh for Fast chargers and 25 p/kWh for Rapid and Ultra Rapid, and review on an annual basis.
- Seek external funding to deliver a minimum of 5% Fast charger provision in long stay car parks and Park and Ride sites
- Assess success of first two HyperHubs and options for delivering additional sites
- Work constructively with commercial operators to ensure the best range of charging facilities and networks are available in York
- Monitor plug-in vehicle uptake in York and usage of the Council's network to assess if the 5% chargepoint condition, supported by HyperHubs, is right. This will be reviewed every 12 months. If EV uptake exceeds modelled assumptions we can respond quickly to ensure that the network remains fit for purpose.

2023 - 2025

- Maintain first class Council network of Fast, Rapid and Ultra Rapid chargers supported by commercial operators providing a wide consumer choice and market leading charging experience.
- Monitor plug-in vehicle uptake in York and usage of the Council's network to assess if the 5% chargepoint condition, supported by HyperHubs, is right. This will be reviewed every 12 months. If EV uptake exceeds modelled assumptions we can respond quickly to ensure that the network remains fit for purpose.

Glossary

EV – Electric Vehicle. The vehicle can only be powered by electricity so requires plugging in to recharge the battery. EV's normally allow both Fast and Rapid charging with new EV's increasingly accepting Ultra Rapid charging as well. Charging infrastructure is essential to EV's as they can't operate without recharging. New EV's commonly have a range of around 200 miles with some offering ranges of more than 300 miles.

PHEV – Plugin Hybrid Electric vehicle; combines a smaller battery with a conventional internal combustion engine and an electric machine. This allows an electric range of between 20 – 50 miles and the ability to drive with an empty battery for hundreds of miles using petrol or diesel. PHEV's generally only accept Fast charging.

Chargepoint Network – The way that users access a chargepoint. We currently use Charge Your Car and Polar Network allowing access via RFiD card or web and providing options for occasional and regular users.

Payment by bank card – In line with national regulations, all new Rapid and Ultra Rapid chargers will accept payment via a contactless bank card (credit or debit card). This allows users to access these chargers without joining a Network.

kWh – Kilowatt Hour; unit of electricity. Car batteries are sized in kWh i.e. a 50 kWh battery stores 50 kWh of electricity.

p/kWh – Pence per Kilowatt Hour; we charge users of the network for each kWh they consume. Our tariffs are in pence per kilowatt Hour

Overstay fee – Rapid and Ultra Rapid chargers are intended to allow users to charge up and get going as quickly as possible, they are not car parking spaces. To encourage appropriate use of Rapid and Ultra Rapid bays and assure they are available for people who need them we will apply an overstay fee. To give genuine users enough time to get a full charge we have set the initial fee at 90 mins. After 90 minutes an additional £10 charge will be applied by Charge Your Car / Polar Network (this includes contactless bank card payments). For every additional 60 minutes a further £10 fee will apply. Overstay fees will not apply to Fast chargepoints.

ANNEX A

On street residential charging

What is the problem?

Terraced streets which have no off street parking present a problem for EV owners. Properties with off street parking can normally easily install a 7 kW home charger that will allow them to recharge an EV at home. However properties without off street parking can't install a home charger.

What is the scale of the problem in York?

Terraced housing makes up just under 25% of the housing stock in York. (2011 Census)

What are the potential solutions?

It is possible for Local Authorities to install chargepoints on highway to provide facilities for EV owners in terraced streets. These sometimes involve modifying lampposts or involve installing a dedicated charging post.

What are the issues?

Lamp post charging relies on the lighting column being next to the road so that charging cables don't stretch across footways causing an obstruction. In common with many Local Authorities, and in line with best practice, City of York Council has undertaken a programme to move lighting columns to the back of the footway. This reduces street clutter improving visibility for drivers and making more space on footways for pedestrians, wheelchairs, buggies and those living with sight loss.

In addition the cabling for street lights can generally only support charging of between 3 – 5 kW which is less than the 7.4 kW delivered by a home charger. This can be appropriate for Plug-in Hybrids but leads to a poor customer experience for EV users due to long charging times.

Generally such systems require the user to buy an additional charging cable to record the power used. In addition to this expense, the tariff per kWh is generally high for a slow connection speed which means poor value for the user.

Despite the relatively low level of power delivered by each unit, the cumulative impact means that generally only a small number of lampposts can support charging on any one street which means that this solution isn't scalable.

Dedicated chargeposts offer a better customer experience as they are capable of delivering 7.4 kW and therefore match the output of a home charger. However they are difficult to site on terrace streets as they will either take space from the footway, which is against the travel hierarchy and undermines the work done to remove obstacles, or when sited in the roadway reduce the available space for car parking. These issues are exacerbated by the lack of space on terraced streets which are generally already deficient in both footway and road space.

A dedicated chargepost is able to transmit more power than a lamppost because it gets a dedicated electrical connection. This however makes installation more disruptive and more expensive. The relatively low level of usage (generally a single user) and potential for Plug-in hybrid usage means that it is challenging to generate enough income from each post to cover ongoing operational and maintenance liabilities. If this solution was delivered at scale it would open the Council up to significant ongoing financial support which is against the principle of the public network.

In an on-street location each chargepost installed needs to have a dedicated EV charging bay with it. This effectively provides a protected private parking space for the resident who has requested the chargepost (if there are initially no other plug-in owners on the street). To bring in parking restrictions requires a residents' parking permit scheme which requires the support of a proportion of residents on the street.

Additionally we couldn't reasonable require a resident to continue using a plug-in vehicle. With leasing now the dominate form of new car 'ownership' it is increasingly common for car users to swap vehicles after 12, 24 or 36 months. This means that whilst a resident may have a plug-in vehicle when they request a chargepost, they are not required to keep doing so.

This issue also applies to ownership/tenancy at the address, which again could not reasonably be conditioned. Whilst in theory any established bays could be used by a new owner/tenant of the property or new EV owners on the street, in practice additional EV owners are more likely to request a facility outside of their property, and given current plug-in vehicle rates it is highly unlikely that any new owner/tenant will have a qualifying vehicle. This would then mean that they wouldn't be able to park in front of their property even if the bay was unused.

Common issues with on street charging solutions

In both cases scalability is an issue. This means that whilst the first few requests on a road may be met subsequent requests could not. This is not equitable and doesn't deliver our goal of supporting EV take up at scale.

A 7 kW charger is a meaningful additional electrical load. It is equivalent to half the total import capacity of a house with a 60 amp fuse and about one third of the import capacity for a house with a 100 amp fuse. From a technical point of view, if additional capacity is needed in a street it can be provided. However the cost of this varies significantly from street to street depending upon the existing electrical supply. In some cases no upgrades will be required. In streets where upgrades are needed the costs can vary from tens of thousands of pounds to hundreds of thousands of pounds, sometimes in adjoining streets. This creates a postcode lottery which would lead to some residents having requests rejected whilst neighbours may have requests accepted. This is not equitable.

On street facilities require a dedicated parking bay, which effectively creates a protected private parking space for one resident. This is not equitable.

These solutions either require high user tariffs (and therefore are not equivalent to home charging options) or will require ongoing revenue support from the Council to cover the cost of operation and maintenance. As a core principle of the public network is that user tariffs should support day to day costs we would have to implement a high tariff. This would make the on street solution less attractive for users and mean that they are more likely to seek out cheaper charging alternatives which would lead to underuse of chargepoints and a shortfall in revenue.

It would be unreasonable to require residents to commit to using an on street charger they have requested on an ongoing basis. This leads to a high likelihood of stranded assets, ongoing financial liabilities with no income, and unused spaces which is likely to cause ongoing issues for residents.

Providing dedicated private car parking spaces does not support City of York Council's long term goals of reducing private car ownership and encouraging active modes of travel. This is particularly important within inner City terraced areas where there are existing issues with lack of space for car parking, limited footway space and congestion. In contrast public charging infrastructure provides facilities for EV owners without supporting car ownership in any one area of the City.

Public chargepoints can support multiple vehicles, this is particularly true for Rapid and Ultra-Rapid chargers but also applies to Fast chargers. On street residential chargers will generally support one vehicle. A ratio of one charger to one vehicle is resource inefficient and as such does not support Climate Change and Sustainability objectives, it will also hold back the uptake of EV's as one for one charger deployment will take far longer and cost far more than public facilities.

What is the answer?

Given the issues outlined above, rather than providing on street residential chargepoints we will provide public infrastructure designed to support residents that don't have access to home charging.

This will be underpinned by HyperHubs which will support 150 kW CCS charging (HyperHubs are also back compatible for 50 kW capable CCS cars, as well as supporting 50 kW CHAdeMO charging) which when used by a 150 kW capable car will provide an average daily range of 20 miles in 3 minutes of charging time or 100 miles in 15 minutes.

HyperHubs transform the charging proposition for residents without home charging as they enable recharging times that can realistically fit into daily life. They also support the adoption of next generation EV's which have battery capacities that mean whilst they can be topped up, they can't realistically be fully charged at home. For instance a 100 kWh battery would take in excess of 13 hours to fully charge from a 7.4 kW home charger or over 30 hours from a 3 kW lamppost. This means that even residents who can top their car up day to day using a home charger will want Ultra Rapid facilities available for the occasions when they need to replenish a large percentage of the battery capacity or they need to quickly top up.

HyperHubs will be supported by a dramatically increased 7 kW Fast charger network. We will work towards providing 5% of parking spaces in all Council long stay car parks and Park and Ride sites. Where there are significant residential areas without off-street parking more than 10 minutes walk from these sites we will investigate alternative charging sites on a case by case basis. We will look at options that will support residents to use these facilities for overnight parking where they don't have access to home chargers, particularly Plug-in Hybrid owners.