



How to meet the  
UK's EV charging  
needs by 2030







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# Foreword: The road to 2030?

In the world of electric vehicles (EVs), two dates loom large on the horizon. 2030 will see sales of new petrol and diesel vehicles banned in the UK and by 2050 the UK aims to reach net zero emissions.

Rapid EV uptake, alongside initiatives that reduce road traffic, are essential in preparing for the challenges presented by these milestones. In a stark reminder of the daunting task ahead, the 2021 report from the Intergovernmental Panel on Climate Change (IPCC) delivered the most worrying predictions on climate change yet, underlining the importance of moving quickly.

Research shows lifetime emissions from electric cars are 30% lower than traditional cars in the UK, and 70% lower in Sweden and France where most electricity comes from renewable and nuclear sources. It is anticipated that these emissions will reduce further as electricity becomes greener and electric vehicle efficiency (miles travelled per kW used) continues to increase.<sup>1</sup>

In 2019 transport produced 27% of the UK's total emissions - almost all from road transport vehicles<sup>2</sup> - yet transport emissions have fallen by just 3% in the last decade<sup>3</sup>. A full EV transition, combined with anticipated growth in renewables, could cut road transport emissions in half. Outside of the energy industry, few investments could have such a dramatic impact.

The Climate Change Committee says there will need to be 23.2 million electric vehicles on the road in the UK by 2032<sup>4</sup> to meet emissions reductions targets, up from around 750,000 battery and plug-in hybrid vehicles today<sup>5</sup>. Bringing forward the ban on new petrol or diesel vehicles from 2040, to 2035 and now to 2030 has brought EVs and sustainable mobility into the public consciousness. Suddenly drivers are taking action.

This change brings urgency. Users of these 14.5 million vehicles will need adequate charging infrastructure. Estimates vary on how many chargers are required but analysis by SMMT and Frost and Sullivan in 2020 suggested the UK will need 2.5 million on-street chargers by 2035 for a full transition - that's 507 per day at an eye-watering cost of £16.7 billion<sup>6</sup>. A more recent analysis by SMMT in November 2021 found that chargers were not keeping pace with EV uptake. The number of plug-in cars potentially sharing a public on-street charger decreased from 11 to 16 between 2019 and 2020 and just one standard on-street public charger was installed for every 52 new plug-in cars registered over the course of this year<sup>7</sup>. On current trends - around 7,000 a year - the UK will just about hit 100,000<sup>8</sup>, though we do expect this to improve even under a worst case scenario - Connected Kerb alone is committed to deploying 190,000 units by 2030.



**Chris Pateman-Jones,**  
CEO, Connected Kerb

<sup>1</sup> Electric cars better for climate in 95% of the world, University of Cambridge, March 2020  
<sup>2</sup> Dept for Transport: Transport and Environment Statistics 2021 Annual report  
<sup>3</sup> Dept for Transport: Transport and Environment Statistics 2021 Annual report  
<sup>4</sup> Climate Change Committee: The UK's transition to electric vehicles  
<sup>5</sup> Next Green Car, Electric car market statistics  
<sup>6</sup> SMMT, Billions invested in electric vehicle range but nearly half of UK buyers still think 2035 too soon to switch, September 2020  
<sup>7</sup> SMMT, Car charging point numbers fall behind as plug-in vehicles surge, November 2021  
<sup>8</sup> How local authorities can deliver bang for buck with on-street EV charging, localgov.uk, February 2021





In future, as today, most charging will be undertaken at home and almost all EV drivers with private driveways today already have their own chargers. More expensive rapid and ultra-rapid charging is developing well in public spaces such as car parks and motorway service stations and provides a valuable option for people running low on charge. But these early successes only cover some use cases; the big challenge now is ensuring charging availability for everyone else. And financing it.

According to the 2016 English Housing Survey,<sup>9</sup> 34% do not have a private space for their car where they could install a private charger (18% adequate street parking, 14% inadequate street parking, 2% no parking provision). A further 28% have 'other off-street parking', such as private car parks where the owner cannot install a private charger themselves. These groups will need ubiquitous affordable and easy-to-access charging points - comparable in accessibility, reliability and economics to that experienced by users able to home charge off-street. They will not want to rely on driving to car parks for expensive half-hour or more charges, as some early adopters have been willing to endure. Beyond this, drivers will want to be able to rely on backup options for occasional use: at work, hotels, conference centres, as well as motorway charging for very long journeys.

This scaled deployment of ubiquitous charging infrastructure will need new long-term financing models which allow investment in charging points across the UK, including those that may take years to make a profit. The industry is migrating from requiring a technology investment for early adopters to an infrastructure investment for the masses. This will need a change of mindset amongst national and local government, investors, developers, and charging point providers.

Chapter 1 of this report explores what drivers want from EV charging, drawing on a new consumer survey conducted with YouGov, to help decision-makers understand the types of deployment needed. Chapter 2 draws on wide-ranging expert interviews to offer insights on how to make informed procurement and deployment decisions, and design mechanisms to fund them.



# Chapter 1:

## What do people want from EV charging?

Successful deployment of EV charging infrastructure around the country will require an in-depth understanding of user need. In a bid to understand what future EV drivers expect from EV charging, Connected Kerb commissioned research with YouGov amongst 2,294 UK residents.



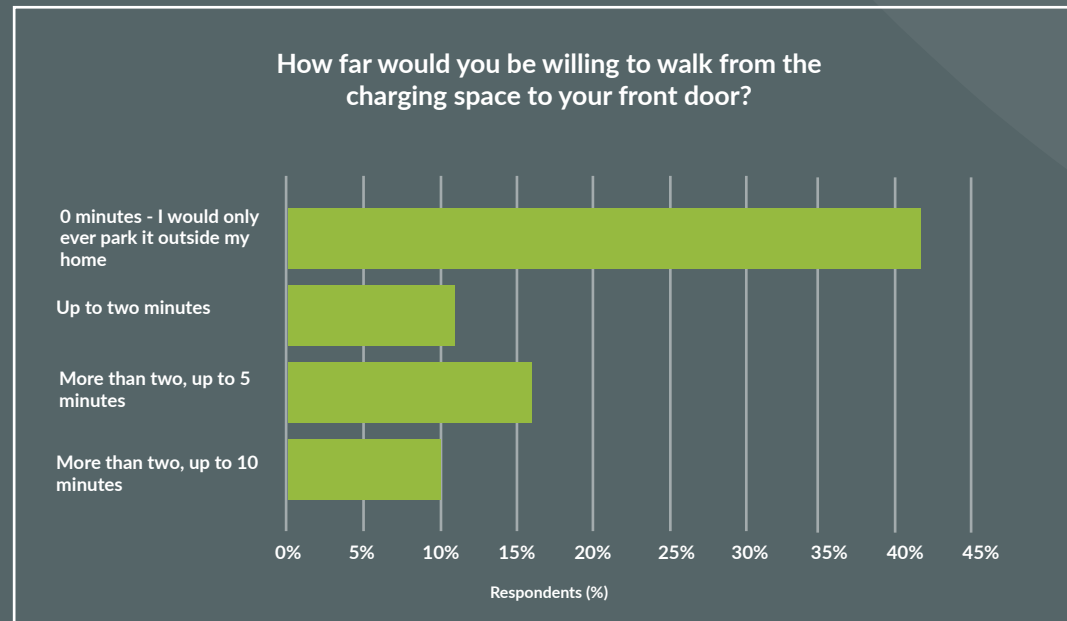


## Users crave convenience and choice

Nearly half of those surveyed said they expect to be able to charge their EV right outside their home. Only 10% would be prepared to walk more than five minutes, showing just how pervasive charging points need to be (see Chart 1). Londoners were most likely to be comfortable with parking at some distance, with only 29% of those asked saying they would only ever park outside their home to charge compared to a survey average of 42%.

### Chart 1:

Distance people willing to walk from a long dwell charge point to their door  
Source: Connected Kerb/YouGov 2021 poll



## Charger terminology

Charge times depend on battery size. Indicative times for comparison purposes based on a 50kWh vehicle charging empty to full.

- \*Slow (3.7kW): 14 hours
- \*Fast (7kW – 22kW): 3 to 7 hours
- \*Rapid (50kW): 1 hour
- \*Ultra-Rapid (150-300 kW): 10-20 minutes

Charging at home was a key priority. When considering switching to an EV, 80% of drivers said reliable, affordable charging where their car is parked at home was essential or very important. This tallies with our 2020 survey of drivers who had already made the switch to EVs, 67% of whom said they would not have bought an EV if they could not charge at home:<sup>10</sup>

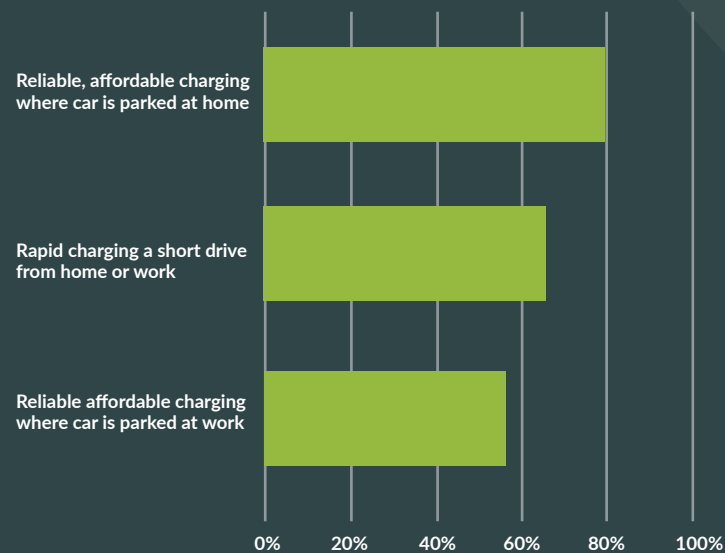
But respondents did not seem satisfied with a single charging option. 57% of respondents said charging availability whilst parked at work was essential or very important.

A high 68% said availability of rapid charging near their home was essential or very important. Having a fast backup option nearby is clearly reassuring, but it is worth noting that the need for regular rapid charging appears to be overstated by non-EV owners, with the utilisation data suggesting that mindsets usually shift towards home charging (or on-street equivalent where it is available) once they switch to an EV and become comfortable with the technology.



**Chart 2:**

Importance of charge point provision when switching to an EV  
(Percent saying 'Essential' or 'Very important')



## Home charging preferred, but many people still unclear

We asked how often people would use chargers at indicative speeds and price points.<sup>11</sup> Answers varied, reinforcing the need for different options. But at least 50% said they relied heavily on slow home charging while a similar proportion would turn to slow charging at work. Fast and ultra-fast charging was deemed as a rare requirement (see Table 1/Chart 3).



<sup>11</sup> We offered price points based on real examples. We acknowledge these vary enormously but we wanted to provide a sense of comparison and trade-offs between cost and time.

**Table 1:**

How often would you use different charging options? Suggested prices and dwell times provided to respondents based on real-world scenarios for comparison purposes. Results rounded.

	Slow home (8 hrs, £8)	Slow work (8 hrs, £8)	Rapid destination (30 mins, £15)	Ultra-rapid service station (10 mins, £30)
Main charge	30%	8%	5%	3%
Regularly	20%	28%	15%	8%
Occasionally	15%	21%	36%	26%
Rarely	6%	7%	16%	28%
Never	9%	15%	10%	16%
Don't know	20%	22%	19%	19%

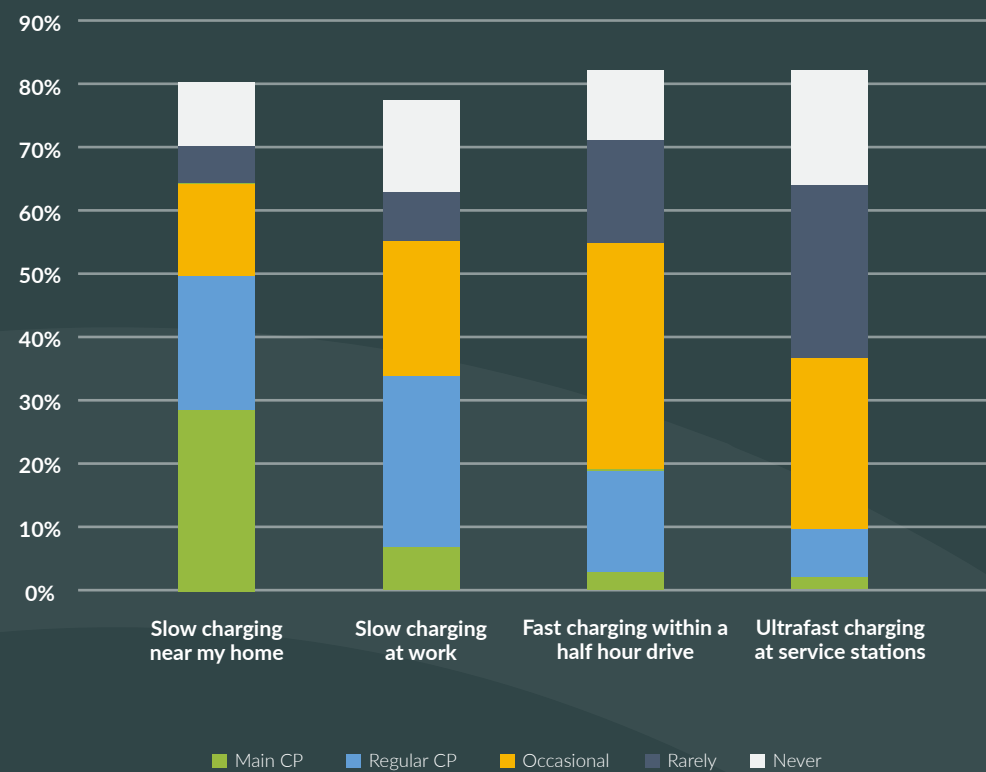






Chart 3:

How often would you use different charging options?



Source: Connected Kerb/YouGov 2021 poll

# Most concerns are surmountable

In a positive development, respondents were very supportive of mass deployment of charging infrastructure. When asked about their concerns, the most pressing was the worry that chargers would block normal parking spaces and even this was only ticked by 32% of respondents. Only 19% felt their concerns could not be addressed.

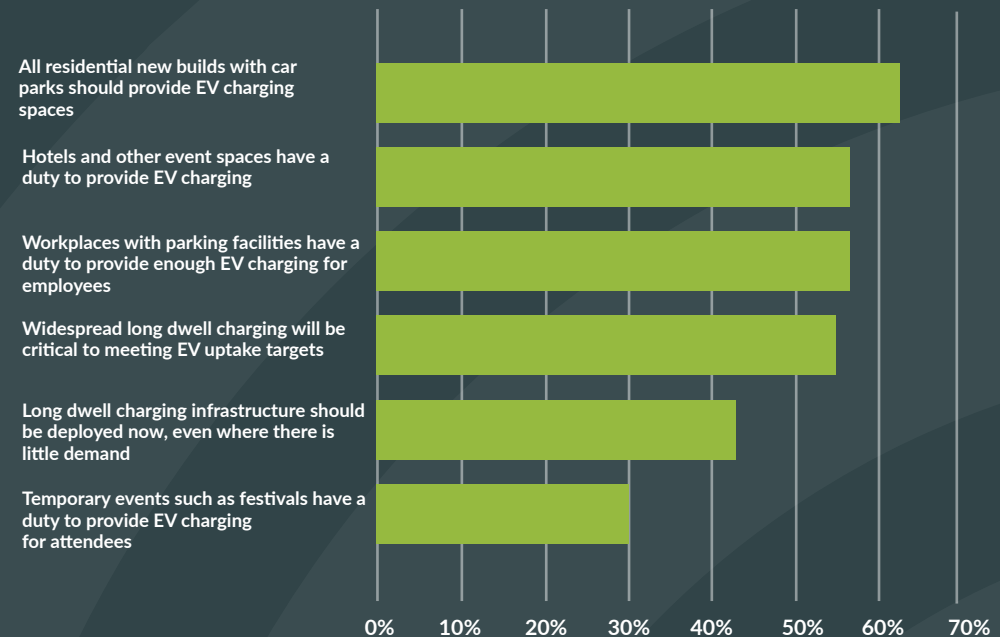
Respondents also showed support for proactive interventions from business and government to ensure charging infrastructure is widely deployed. 64% said all new builds with car parks should provide EV charging spaces while 55% and 56% said workplaces and hotels respectively have a duty to provide EV charging.

Over half, 53%, thought that widespread long-dwell charging (ie charging where cars are parked for several hours) will be critical to EV uptake, and 43% said long dwell charging infrastructure should be deployed now, even where there is little or no demand, to prepare for the EV transition.

It is significant that over half showed active support for strong interventions, and it is worth noting that the Government has now mandated EV charging provision in new builds. This shows a real desire amongst the public for the EV transition to happen. This must be capitalised upon. But it must be done in a way that maintains and builds on that goodwill by ensuring deployments align to user needs and do not create unwanted problems such as blocking pedestrian access or making home parking challenging.

Chart 4:

## Support for the EV transition (% agree)



Source: Connected Kerb/YouGov 2021 poll



## Still a journey ahead for many

Despite positive findings, many people have not yet thought in depth about EVs. A quarter ticked 'don't know' in response to being asked about EV infrastructure concerns, suggesting they had not engaged with the issue. Around 20% didn't know which types of chargers they would use most regularly.

Knowledge of EVs and their benefits is also low. When asked how much they thought it would cost to charge an EV, 39% said they didn't know, and answers reflected a very broad range of prices, many of which were a long way away from reality.

Education about the benefits of EV ownership and what it is like to be an EV driver is critical. And there does seem to be an appetite for such education. A separate poll of 2,029 UK residents, which Connected Kerb commissioned earlier in 2021 showed 74% of the UK believe the government should do more to educate the public about EVs. The age demographic is also significant with older generations aware of the 2030 ban but less concerned by it while younger people are less aware of the ban but more actively supportive.

With the right education and infrastructure, there are reasons to think many will find EVs are more accessible than they expected. When asked what 'price point for a full charge' would convince them to switch to an EV, the average answer was £20. Yet most charges are well below this, showing a clear information gap around the benefits of EVs. Whilst infrastructure represents the bigger challenge, closing this knowledge gap will be critical to ensuring people want to make the switch.





# EV charging stats 2020-2021: A snapshot of the industry's findings

## Transport and Environment Statistics 2021 Annual report

- On 1 April 2021, **22,790** public electric vehicle charging devices were available in the UK, **4,259** of which were rapid devices
- **7** of **10** local authorities with the highest number of devices were in London

## Society of Motor Manufacturers data - November 2021

- Plug-in vehicles accounted for 1 in 6 new cars registered in 2021
- **4,109** new public charge points were installed between January and September 2021, compared with **212,181** new plug-in car registrations, equating to one charger for every **52** new electric cars
- As new EV registrations outstrip new chargers, the ratio of vehicle chargepoints to plug-in cars deteriorated by **-31%** during 2020
- Britain's ratio of plug-in vehicles to public chargers is **16:1**, behind countries including South Korea (**3:1**), the Netherlands (**5:1**), France (**10:1**), Belgium and Japan (**both 13:1**)
- London has the highest ratio of cars to chargers at **10:1** whilst the East of England has the lowest availability at **49:1**







### Connected Kerb – Education and incentives, February 2021

- **74%** of UK adults believe the government should do more to educate the public about EVs
- **46%** are likely to make their next car purchase an EV if charging is installed on their street or at work

### Electric vehicles and infrastructure - Researching briefing, June 2021

- The amount of EV charging points per **100km** of road in the UK has risen from **42** in 2011 to **570** in 2019
- **£1.3 billion** of government funding covers strategic road network, homeowners, local authorities (for on-street charging), and workplace, as well as regulatory changes
- Battery EVs require approximately **£3** of charge to cover **100km**, Hydrogen Fuel Cell EVs would cost **£10-15** worth of hydrogen consumption
- **29,000** public charging points are needed across GB by **2030** - **85%** to be fast (22kW) or rapid (43+kW)

## Zap Map – 20th August 2021

- Charging points in the UK: **43,453** connectors, **25,226** devices, **15,884** locations, **627** added to the Zap Map database in the last 30 days
- Rapid charging points in the UK: **10,874** connectors, **4,722** devices, **3,042** locations, **120** added to the Zap Map database in the last 30 days
- Between 2016 – 2020, there has been a **220%** increase in the number of public chargers

## Policy Exchange – Charging Up, 2021

- Charging point operators will need to invest **£5-10 billion** in charging points and grid connections upgrades by 2030

## Field Dynamics - “On-Street Households: The Next EV Challenge and Opportunity” (2021)

- **8 million** GB households outside of London have no off-street parking, and currently **90%** of those households are further than a 5min walk from a public charger





## Chapter 2:

# How to deliver EV charging infrastructure to meet 2030 needs





As our research shows, there is a need to deploy a wide range of charging points in different places: residential on-street, workplace, destination, and en route. These are not single technology solutions, but complex ecosystems with many different players.

Those responsible for the deployment of EV infrastructure need to understand their user's needs, which should inform long-term roll-outs, and design procurement processes that incentivise charging point providers to deliver quality long-term deployments.

Meanwhile, charging point providers need business models that allow them to make money, in a market that is still young, whilst offering acceptable fees across each of the different use cases - from on-street residential to ultra-rapid. Operating rapid destination chargers in busy locations where people pay a premium has a functional business model that can be expanded. The next phase of EV infrastructure - deploying hundreds of thousands of chargers on streets and in workplaces, where people park for long periods and expect low costs - is a very different model. There was a sense amongst our expert contributors that the latter has not yet been fully cracked.

Through interviews with experts in funding, infrastructure, policy and EVs, we have identified opportunities to make the transition faster and smoother. We have divided recommendations into four audiences, although awareness of each other's issues is important to all. Only by addressing them collaboratively can we create a charging ecosystem that meets the EV driver's needs.



# A) Local authorities

Local government has the most critical role to play in accelerating EV charging build-out, but also the most complex balancing act of anyone in the ecosystem. They own many car parking spaces which can host charge points. They are the ones planning the largest scale deployments, granting permissions for charge points, and deciding who delivers each project. Local authorities have the presence, and the mandate to ensure the provision of consistent, high quality and affordable services, and address the concerns of their constituents. The following are key considerations to help them do so.

## Understand diversity of user need and use it to inform deployment

**Thierry Mortier of EY says, “We have to understand driver behaviour and adopt a roll-out based on those insights, not just where there is traffic”.**

Our research offers a good starting point. Most users expect reliable, slow and fast charging whilst their cars are parked and rapid charging for when they are running low. On-street residential is a big part of near-home charging, and is almost entirely the preserve of local authorities. This broad insight should provide some focus.

Nonetheless, each case is different, and well planned user research is needed to understand where to focus deployment locally (see 'User input in action' for an example of how to do this).

### User input in action: Durham

In November 2020, Durham launched an 18-month community-led project to install 100 electric vehicle charge-points (EVCP) throughout County Durham car parks. Community research demonstrated that 40% of housing is terraced, with no space for off-street charging. Importantly, it also showed that 70% of respondents would be happy to walk 5 mins from their home to charge an EV. Understanding local infrastructure and community opinions is crucial and has allowed for diverse sites to be identified, such as parish church car parks, leisure centres and libraries.





## Plan large scale deployments to enable a rapid transition

“Local authorities need to think bigger and longer term”, says Yogesh Patel of Eurovia. “Too many are talking about two, three, ten charging points, rather than the hundreds or thousands that they need.

User research must look at how demand will evolve over the long term, then plan to meet changing needs. Once it is recognised that a residential area will eventually need hundreds of chargers, the calculus for planning changes. Instead of thinking ‘how do we install a few chargers now?’, councils can start thinking ‘how can we put in the infrastructure that will allow us to scale?’

Planning for scale means making early investments in beneath-the-ground infrastructure such as grid connections, electronics and software. “If possible, combine this with roadwork schedules or civil works such as the roll out of 5G” says Patel. “Then, every time you need to add charging points, it’s a case of opening the hatch and connecting it up.

Working out what you’ll need for the next 20 years and putting the infrastructure and processes in place to deliver it will mean more work now. But it will be cheaper and easier in the long run”.





## Procure infrastructure that is built to last

A common mistake is to think the cost of EV deployment is all upfront capital expenditure to get chargers in the ground. But half the cost is maintaining network for the long haul, which creates ongoing liabilities and operating costs.

Councils that focus on deployment will get tenders to do just that. This will end up costing more in the long run, as they will need to contract additional service teams to handle service and maintenance. Further to this, tenders that focus on deployment rather than lifetime management may incentivise suppliers to choose lower quality charging points, which will need more frequent repairs and replacements (many charging points currently last just seven years!)

Two issues should therefore be addressed upfront. Firstly, buy kit that is environmentally sustainable and built to last. Secondly, work with installers who have priced in lifetime operation and maintenance. The two go hand in hand. Charging point providers who are also responsible for operating or service contracts are incentivised to create long lasting deployments that reduce their own liabilities.



## Adopt long term investment models to pay for deployment ahead of demand

The chicken and egg nature of charging infrastructure and EV adoption means that infrastructure provision is lagging EV adoption across the UK. To tackle this lag, charging networks need to be deployed at a scale that is unlikely to be funded by central or local government.

Councils must work with charging point infrastructure networks to attract investors able to provide the required capital – estimated by Frost and Sullivan to be as much as £16bn by 2050 in the UK alone. This means understanding investor incentives, attitudes to risk, and time scales on which they expect a return, in order to design procurement processes that deliver value to the council and users, profitability to the CPO, and which meets the funding thresholds of the investor.

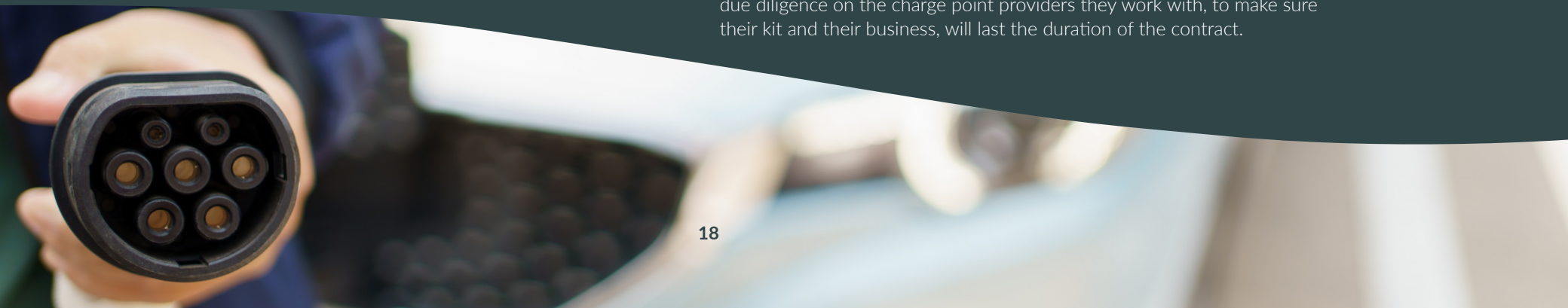
“In most cases, delivering quality EV charging, at a price people are willing to pay, comes with long payback periods” says Thierry Mortier at EY. “Rapids can make a quick buck in a few high margin areas. But the most EV chargers in residential and working areas will only turn a profit for investors who are prepared to put long lasting kit in the ground and wait 10+ years to make money.”

Targets set by the UK government (and others) towards and beyond 2030 mean investors typically perceive the risk of investment into EV charging to be around ‘when’ charging networks will be profitable, not ‘if’.

As EV charger network utilisation risk is driven by speed of adoption over time, investors in this market seek long tenure of contracts that balance early year risk of low utilisation, with longer term certainty of high utilisation in the later years of the contract – in the UKs case, beyond the 2030 deadline set by government for ICE vehicle sales. The exact term required will vary across regions and even between sites which is why investors also seek scale, where variations in utilisation growth (determined largely by the wealth of an area) can be offset against each other. Similarly important to investors is control over tariffs, particularly in light of the current energy crisis which has dramatically increased operating costs.

Unless the utilisation risk investors face (before mass market EV adoption is achieved) is recognised and mitigated through long tenure contracts, councils are unlikely to attract suitable partners. A five-year contract is likely to attract investors looking to make a quick buck, which they can only do through high tariffs for charging or council protection from low utilisation. Such investors will only finance projects in areas with high EV adoption and a clear route to short-term profits. They are also unlikely to spend money investing into quality infrastructure which requires higher initial capital, but is more cost effective over the long run. Ryan Robertson at East Lothian Council cites a story of a council who wanted to install thousands of charging points on a five-year concession period; “The payback period wasn’t sufficient to deliver investor returns, so they didn’t get good proposals,” he says.

A 15-20-year contract on the other hand will attract infrastructure investors and pension funds who are in it for the long haul. They will be willing to take informed, data-driven bets on areas that are unlikely to make a profit for 5-10 years, but highly likely to over 15-20. They can set lower tariffs because they are not reliant on short term profits and are incentivised to build customer loyalty and networks. They will also conduct due diligence on the charge point providers they work with, to make sure their kit and their business, will last the duration of the contract.





## Ensure charger design meets driver needs

Once you get to the nitty gritty of deployment, the main consideration is making sure chargers work. 'Charger anxiety' - the worry of not knowing if a charger will work with your vehicle, or at all - is a big barrier to uptake.

"This is a technically complicated area" says Yogesh Patel. "The charging solution you need in a residential street is very different to a petrol forecourt. It can be hard to know if the solution being proposed is really fit-for-purpose. There is a need to build expertise when scoping the technical aspects of a tender." He points to technical support from The Energy Saving Trust<sup>12</sup> and The Go Ultra Low City Scheme<sup>13</sup> as a good starting point.

## Make EV deployments inclusive

Design inclusivity into EV charging infrastructure. Research by Motability and Ricardo estimates there will be 2.7 million UK drivers or passengers with a disability by 2035. This group disproportionately lives in homes without private parking, and is less likely to switch without very reliable access to charging. As a result, they are under-represented as EV drivers.

Catherine Marris of Motability notes that "charging infrastructure presents accessibility challenges from charger height, weight of cable, readability of interface, lighting, lack of space around the car, or lack of dropped kerbs".

As with parking spaces, councils and builders need to provide sufficient charging that is designed for drivers with disabilities. "There is a menu of desirable features that should be considered as much as possible" says Marris. "This must be matched with good communication, eg through apps. Many disabled drivers can plan to overcome limitations of infrastructure if they know what to expect when they arrive".

New standards on accessible charging are coming in 2022, developed with the DfT and BSI.<sup>14</sup> Until then, Motability and Designability's User Engagement Report on Accessible Charging<sup>15</sup> provides a detailed breakdown of user needs that should be considered in any deployment.

<sup>12</sup> On-Street Residential Chargepoint Scheme guidance for local authorities, OZEV, November 2021

<sup>13</sup> London's Go Ultra Low City Scheme, London Councils.gov.uk, March 2019

<sup>14</sup> UK government partners with disability charity to set standards for electric vehicle charge-points, Gov.uk, June 2021

<sup>15</sup> User Engagement Report, Accessible EV Charging, Motability UK, August 2021

## Mix deployment with education

"When you speak to a member of public, there's still a lack of understanding about the benefits" says Eurovia's Mr Patel. If people do not see the benefits, they will not support, let alone use, the infrastructure.

EV roll-outs need to include engagement with local communities.

Clear information about how to access, reserve and pay for local chargers helps assure people that they will always have somewhere to charge. Cost comparisons with regular non-EV vehicles can be an effective way to emphasise the benefits.

This can be undertaken by providing information near the chargers themselves, but also extend to local consultations, email campaigns, and/or local media engagement. Councils may want to build their own education campaigns, or include an education requirement as part of any procurement tender. Again, if the contractor knows they have a long-term contract, it will be in their interest to invest in activities that drive demand.

## Consider the role of fleets in the transition

A final and often overlooked point to consider is using fleets as a starting point for EV deployment, including logistics companies, taxis and company car schemes.

Simon King of Mitie, says: "Fleets are heavy users of vehicles so it's an area where big emissions reductions, and big fuel cost savings can be made, so the business case is strong". A fleet transition will also create a second hand EV market in a few years, supporting lower income drivers to make the transition.

All these vehicles will need a place to charge overnight and top up during the day. This provides opportunities to secure quick wins by rolling out significant charging deployments aligned to a very clear demand, creating high value use cases and learning valuable lessons. Collaboration and data sharing between councils and fleet operators will be key to making effective deployment decisions.

There is an opportunity for councils to strike deals that let fleets charge in car parks during the quiet night-time hours, boosting the financial case for an EV roll-out in these spaces. In addition, as King points out, "many drivers keep vehicles at home overnight, and they often live in areas without private parking. So an effective fleet strategy means providing on street charging for these people, or they may lose their jobs."





## B) Private parking operators, landowners, and builders

Private companies, who build or operate places where cars park, need their own EV charging strategy.

This is a broad group which includes operators of workplace car parks, fleet managers operating depots, private car park operators (including hotels, supermarkets, and event spaces), and firms building or managing homes with private car parks.

The game has recently changed here. New legislation requires charging points to be installed in every new residential building with car parking space, and when existing blocks undergo an upgrade. Office blocks will require a new charging space for every five parking spaces.

This legislation is a positive development for the EV industry, but blunt legislation can sometimes turn important planning into a box ticking exercise. Companies building and managing these facilities still need to ensure that deployments are well thought through and aligned to user need. It should also be borne in mind that most charge points have a three year warranty so many may be out of warranty by the time they become usable, so those investing in these deployments should think about infrastructure upon which chargers can be added as required, rather than buying in short life assets.

Nonetheless, each case is different, and well planned user research is needed to understand where to focus deployment locally (see 'User input in action' for an example of how to do this).





## Install ahead of demand

Anticipate how EV use will grow and plan accordingly. Tom Malcolm Green at Avison Young, says “Property developers are starting to plan ahead of demand – and incoming regulations – by designing behind-the-scenes infrastructure and putting the right electricity provisions in place in private car parks from the start. Then it is simply a case of plugging in a charging point terminal when demand grows.”

Doing this in one go is a big time and money saver down the line (See ‘Planning EV enabled homes for the future’). Where space is limited, one option is community charging spaces, where 2-3 chargers can be shared amongst a group of users.

Ian Cameron of UK Power Networks says workplace charging is ‘nascent’, but over the coming years, workplaces operating staff parking should deploy charging in similar ways to private residential car parks.

### Planning EV enabled homes for the future

The Wichelstowe project is a 20-year, 3000-home development by Swindon Borough Council and Barratt Developments. Working with Connected Kerb, the project deployed underground enabling infrastructure for over 130 EV charging points during Phase 1 construction. An initial 20 active charging sockets were deployed in shared and visitor parking bays. As demand from residents increases, new EV charging sockets can be installed in less than an hour – including future designs – and smart software allows load management as demand scales.







## Develop business models aligned to your long term goals

Developers who will not manage the property over the long term may be tempted to discharge their duty by deploying chargers and forgetting about them. This is a false economy that may cause them reputational and legal problems down the line.

A better solution for those looking to avoid long-term liabilities is to work with charging point providers that can handle the installation, operation and maintenance over a long term contract. If the charge point provider can set pricing and add chargers as needed, they can take the risk off the builders, whilst providing a solution that flexes to changing user demand. This contract can then be sold to facility managers once they take ownership.

Alternatively, landowners/operators who have long term commitments to users may prefer revenue sharing models where they cover upfront deployment costs, then agree a cut of the revenue generated. Some may even wish to subsidise charge points in order to deliver other benefits, such as employee incentives.

## Provide clear information to users

Clearly communicate to users what the charging provision is and what to expect. If chargers are designed for slow charging, be clear about that so drivers don't return to their car after half an hour expecting a full charge. Be transparent about who can park in the spaces, how they access it, and what and how to pay. If spaces need to be shared, set reasonable time limits and usage allocations that are easy to follow. Make it clear to non-EV drivers where they can and can't park. This will all be new to many users.



## C) Central government

Much credit goes to the government for its ambition so far, including its recognition in the October 2021 Net Zero Strategy, backed by £620 million of funding, of the need for more local on-street residential charging. But more is still needed in the form of resources, capabilities and advice, to help local authorities translate national targets into concrete changes on (and under) the ground.





## Create more funding, whether public or private

Tim Middleton, Transport Planner at Kent County Council, says “the £20 million national annual funding pot for local authorities could be spent by Kent alone”. To deliver the infrastructure needed for the EV transition, more capital is needed, whether from government or through mechanisms to attract private investment.

Most could be provided by private finance, but there is need for government support to encourage long term sustainable investment by redesigning procurement to help minimise the risk in contracts in the early years (pre-2030) of EV adoption.

A well-structured, large-scale 20-year contract will create a business case that allows infrastructure investors to finance projects, even when they will take time (due to low initial utilisation) to turn a profit. This creates a business case for installing ahead of demand, by offsetting initial utilisation risk with a longer term licence over which to generate revenue, and so provides near-certainty of return over the contract period.

Thinking like this will be critical to many on-street EV deployments, particularly those in lower income urban areas, where the cost of

vehicles means that adoption (and therefore charger utilisation) may be suppressed in the early years of the contract, but will rebound towards and beyond 2030 as the second hand market grows and EVs become mainstream. The costs and environmental benefits of EV represent a huge levelling up opportunity, but without appropriate financing, poorer communities will be left behind.

“There is a postcode lottery,” says Ian Johnston at Osprey. “A tender in a wealthy part of the southeast where there’s lots of EVs has a clear business case. On the north-west coast of Scotland, utilisation is lower, and it’s hard to get a great offer to those areas.” If we don’t incentivise longer term investment, many will be left behind.

Governments may need to step in with enhanced support for the deployment of infrastructure at scale across some segments of society in the short term. But as we move towards and beyond 2030, anyone who can afford to run a petrol car, will be able to benefit from the lower charging costs of an EV. In these settings, taking the long term view (on contracts and infrastructure lifespan) will be key.

Government needs to support councils to set up procurement terms that attract long term infrastructure funding for scaled deployment. If it does that, portfolios of investments can be created, where richer areas that deliver value immediately can subsidise poorer ones that will take longer to see profitable levels of utilisation.



## Send clearer signals to councils about what they need to do

Ian Johnston sees the government as well-placed to set the overall direction and empower councils to deliver. "The biggest thing that could be done overnight, is if the central government said: 'every borough must run a tender in the next six months for EV charging' and then give local authorities the budget and resources to run them".

Government also needs to coordinate councils better, by setting clear expectations of the industry around interoperability, encouraging consistency between councils, and creating mechanisms for them to share procurement best practice, especially between neighbouring councils. Tim Middleton at Kent County Council recommends a centralised portal for local authorities to share procurement experiences and advice. "It's a new industry and it's hard to know if you're being sold a good bit of kit. Sharing data behind the deals - what revenue share did you get? What were the fees? - you can develop frameworks for this. Everyone is trying to work this out...and we should be doing this together".

## Roll out a national education programme

It is clear from our research that EV understanding remains poor, but people want to understand it better. There is demand for better education around what switching to an EV means for drivers. The EV industry can do more (see next section), but government-backed campaigns can always resonate better than those from private companies.

Some of this should be done locally as charge points are deployed, but a national information campaign, including TV ads, highlighting EV benefits, and ease and cost of charging could have a huge impact on EV uptake.

## Set an example with a big government estate

Significant momentum could be achieved if governments undertook large scale EV charging point deployments across their own large estates such as the National Health Service (NHS) or the Ministry of Defence (MOD). Huge deployments could support a large workforce, providing a much-needed incentive for government employees to switch.



# A big idea: Electrify the NHS



## Why the NHS?

The NHS is an obvious place for an ambitious EV infrastructure project. It has +1m employees, a large fleet of vehicles, and operates nearly half a million parking spaces where chargers could be installed. It's well-established company car/salary sacrifice scheme could evolve to encourage EV uptake, and guaranteed workplace charging would derisk transitioning to an EV. It would also offer a serious subsidy to staff in reduced fuel bills.

It's employees are diverse and nationwide, helping spread EV ownership around the country. It would show government commitment to the transition at home and abroad. And having the most trusted brand in the UK pioneering the shift would only boost the reputation of EVs.

Such a project offers a chance to boost for UK innovation in EVs. A deployment of this scale would be the largest in the world and provide a blueprint for other projects. If it was awarded to UK businesses, it would help them scale to become dominant global players that could export around the globe.







## The scale of opportunity

- The NHS operates around 436,900 parking spaces at NHS England hospital sites
- Current data is not split, but historical data suggests around 200,000 are for staff and the rest for patients/visitors
- Similar workplace charging schemes suggest drivers without home charging will charge their vehicles 2-3 times per week, and those with charging at home less often
- A good guide would be to aim to deploy EV chargers in 25% of staff bays, though a full analysis of transport patterns and power availability would be needed at each site
- We would assume a deployment of charging infrastructure in 50,000 bays over five years
- Once delivered NHS fleet services and company car schemes could be used to incentivise vehicle transition

## How to finance a project of this scale

- Privately Funded: Deployment funded by infrastructure investors who recover costs by charging drivers. A long term (15+ year) contract would allow tariffs to be lower than most alternatives. Costs can be increased (e.g. for visitors to generate NHS revenue) or reduced through subsidies (e.g. to incentivise staff) as required
- Lease: The NHS pays an annualised cost for the charging infrastructure and operating costs to lease provider. They then choose the tariff to be applied for charging and/or whether to subsidise
- Government Funded: Government funding covers capital investment with option for full or partial cost recovery from user charging

## D) Charging point operators

While a significant onus for EV charging ubiquity is on central and local government, the experts interviewed for this report also saw potential for the EV sector to do more.





## Ensure interoperability between chargers

One area still holding back adoption is interoperability and reliability, as some EV drivers complain about the difficulty of using charging points, charging points being down, and frictions like having to download many different apps.<sup>16</sup>

“Every charger seems to have their own customer app and payments system,” says Eurovia’s Mr Patel. “A common platform and approach that will enable authorities to switch from one provider to another is something that’s worthwhile standardising. The government are consulting on some of those areas at the moment, but it’s one that the operating part of the EV market needs to coordinate better”.

Although businesses can be protective, collaboration and competition will benefit everyone in the long run, spurring uptake and creating a larger pie for everyone to take a slice.

## Eliminate charger anxiety

Most chargers are now pretty reliable, but problems still seep in. “Sometimes it can be as small as an OEM has made an over-the-air firmware update on the vehicle, and not updated one of the charging companies to make the parallel update,” says Ian Johnston. The user, of course does not know this, they just see a charging point that doesn’t work and feel frustrated.

Charging point operators need to invest in customer service, both responsive and proactive. They need to conduct regular vulnerability tests, including with all vehicles and monitor firmware updates that may cause problems. Better communications to flag problems and likely solutions, as well as responsiveness to complaints, would also help reduce user anxiety. This will be necessary for them to move from selling charging points, to selling long term infrastructure delivery and management contracts, of the type needed to make many EV deployment use cases viable.



## Communicate to users to promote EV driving

Ensure any charging point roll out has an associated communication strategy that ensures users are clear on how to use them and costs. Where deployments are residential, community engagement around the benefits can help spur people to consider switching.

Introductory offers such as reduced costs or trials of lease vehicles, or 'first 100 miles of charge free' can help convince people to switch. Launch events with local media or letter drops can help spread understanding. Forming internal divisions or external partnerships that deliver these benefits helps create a virtuous circle of uptake, which in turn drives demand for chargers, and shortens payback times.

## Keep innovating

The UK EV private sector needs to play a role in developing future technologies like wireless/inductive charging, at which the US and Europe are further ahead, argues Mr Patel. This type of charging could offer an alternative to plugs and charging points and allow vehicles to be charged during usual use, such as while stationary at traffic lights, minimising downtime, enabling the use of smaller batteries and further calming range anxiety.<sup>17</sup>

And of course they also need to keep innovating in their charging point designs, to enhance lifespan and minimise environmental impact, for example by developing less intrusive models and using ever more sustainable materials. If millions of chargers are deployed, it is important they do need replacing often, and that they are recyclable if they do.

The sector also needs to ensure their technologies are adapted or adaptable for people with disabilities and older drivers. Both groups tend to use cars over public transport - but they are also often more risk averse and may have distinct concerns around convenience.<sup>18</sup> Wireless charging offers a long term solution, but whilst it is still an early stage technology, more disability friendly charger designs and positioning are required in the interim.



## Conclusion: What can be done right now?

We conclude by summarising a series of recommendations for the different players involved, developed in collaboration with our expert interviewees.





## Key recommendations for local authorities

- Think big, the only way to meet EV targets will be to move from 10s to 1000s of charging point deployments
- Conduct local research and seek out data to truly understand where charging can best benefit users
- Develop financing models that incentivise investment in large scale, long term charging point deployments
- Deploy core underground infrastructure (ducting and electrical capacity) ahead of demand then scale charging points as needed
- Engage stakeholders to develop procurement processes that are focused on the goal of delivering reliable, affordable and accessible charging infrastructure
- Make sustainability and durability a condition of procurement
- Develop education campaigns to encourage uptake
- Proactively target high-use vehicles to make the transition – eg taxis and professional drivers – with a mix of at home and reserved slow charging and rapid city charging



# Key recommendations for private car park developers and operators

- Model your user base – space usage, dwell time, vehicle type - and align capacity to need
- Deploy the underlying infrastructure in one go
- Monitor changing demand and add the socket end points as need demands
- Consider the best business model for your use case and long term goals: eg outsourcing everything to a charge point provider, or ongoing collaboration and revenue sharing
- Look to successful use cases for effective engineering and economic models
- Provide clear information to users about payments, operation and fair usage



# Key recommendations to central government

- Recognise that EV infrastructure will require more financial support than currently available, especially in areas with low EV uptake
- Provide guidance to local councils to design procurement that better harnesses long term private sector investment
- Work with EV charging point companies to establish fair guidance to local authorities on how to run a tender which delivers long-term national EV charging goals
- Set examples and build use cases for massive EV charging deployments in large government estates, such as the NHS
- Develop a long term national EV plan that ensures balanced access across the UK
- Develop a national campaign explaining the benefits of driving an EV





# Key recommendations to charging point providers

- Engage collaboratively to ensure charging points are interoperable
- Coordinate with automotive manufacturers to ensure reliable charging dynamics
- Innovate to embrace new technologies to maximise reliability and ensure designs are suitable for, or can be adapted to, all accessibility requirements, including the elderly and those with disabilities
- Deploy communications plans alongside rollouts designed to encourage EV transitions and charger use
- Share data on site selection to allow providers to coordinate roll-outs that serve local needs, and to build data that will help understand appropriate site selection and business models for less obvious deployment locations





# About Connected Kerb

Connected Kerb is one of the UK's leading charging point providers, delivering future-proof, cost-effective and sustainable EV charging solutions for the public sector, developers, fleets, workplaces, car parks and other organisations to help accelerate the transition to EVs for all. Its unique solution combines power and data at the kerb to deliver user-friendly and reliable charging and provide the foundation for connected cities and communities.

Contact us at [ryan.spillane@connectedkerb.co.uk](mailto:ryan.spillane@connectedkerb.co.uk) to discuss the findings of this report and how we can work together to build a fit-for-purpose EV infrastructure that works for everyone.





