



COMBINING PARKING AND EV CHARGING TO SUPPORT ALL DRIVERS

Key considerations for Local Authorities in making the EV transition



Introduction

EV charging sits neatly alongside a parking strategy, and it makes sense to think of the two in parallel. Most public chargers will be deployed in spaces currently used for parking – on street and off-street.

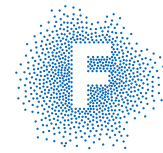
But deploying EV chargers is not a numbers game. Different drivers have different needs when it comes to duration of stay and payment preferences. Local Authorities have different needs when it comes to how they deliver for their residents, as well as incentivising good driving and parking behaviour. All of this needs to be accommodated with an eye on the long term, ensuring we deploy charging infrastructure that will continue to work throughout its lifetime, with consideration given to managing, integrating, and maintaining a vast new network of infrastructure.

As with any new challenge, early experimentation has not always delivered. Some councils have to deal with a legacy of chargers that don't work well, are

expensive to maintain, or which don't connect to their backoffice. There is a now an imperative to move fast to meet the Governments 2030 deadline, but this must be done with a view to delivering good EV charging options that work and last.

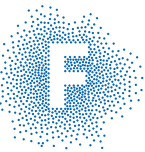
At Flowbird, we have long been considered a safe pair of hands that can help Local Authorities navigate parking and payment infrastructure. EV charging is the natural evolution of this, and one where we are playing a critical part.

Through expert interviews and, drawing on our ongoing conversations with many local authorities, we have put together this guide to share our insight and help navigate the complexity of a managed roll out of charging infrastructure into parking spaces across the UK.



PART 1: THREE LOCAL AUTHORITY CHALLENGES FOR AN INCLUSIVE EV TRANSITION.





1. Where and when to install

The physical act of installing a charger is not a problem. But there is a careful balance to be struck between investing to incentivise demand, and not spending money that will not deliver for years. This is made more complex by network effects – chargers need power connections, so whilst spreading chargers evenly around a city’s parking spaces may be fairer, clustering lots close together makes sense from an engineering and economic point of view.

LAs need to make informed decisions on when and where to deploy, in a way that works for their own unique population and physical limitations of space and energy capacity.

2. How to manage use of space

Chargers will mostly go in parking spaces. But parkers and chargers may have different needs. An EV driver may want to park for four hours but only charge for one. Non-EV drivers will still need to park. This dual-use approach changes the nature of parking space and decisions will need to be taken about management of parking and charging.

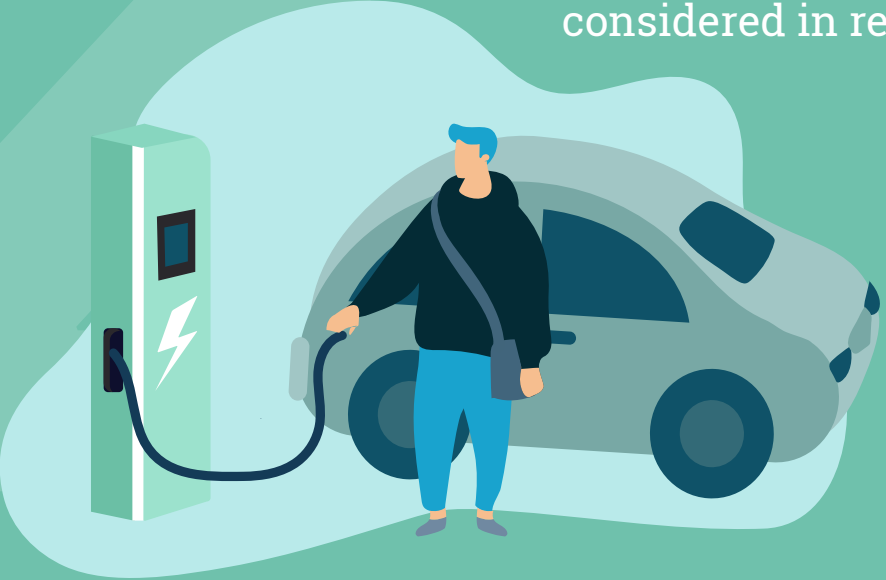
3. Creating a smooth user journey

Key to uptake will be enthusiasm of drivers about the chargers. They need to see them as reliable, affordable and easy to use. Local authorities must focus on providing functioning kit that delivers fair and easy-to-use payment options for a wide range of users, supports parking and charging, and is inclusive to the young and the old.



PART 2: OUR RECOMMENDATIONS FOR A SMOOTH EV CHARGING ROLL OUT

The three challenges above need to be addressed as part of a multifaceted approach. In this section we summarise a number of issues that should be considered in resolving these challenges.



Use data to understand driving and parking patterns

The starting point is to understand where chargers will be needed so you can plan your approach. Some of the decisions will need to be long term strategic ones, others short term deployments. Both can be improved by data.

By looking at parking usage and driver data you can understand space utilisation. This will help inform your strategy – telling you firstly where EV drivers park, and secondly what general parking trends are.

Different use cases will need different solutions. “But broadly speaking” says James O’Neill, CEO of Paythru and previously of Innogy eMobility, E.ON’s EV charging business, “most town centre car park charging will be opportunistic, with people charging whilst they are there anyway. Logistics fleets will need a full charge whilst they are stopped overnight, and quick high-power hits throughout the day aligned to where they take breaks. Then there is the distressed charge, where people need a charge at short notice, usually just

enough to get them home”. There will also be a big demand for on street parking for those without driveways, who will need somewhere to charge cheaply overnight.

Granular data, such as number plate data from ANPR, payment terminals and apps, can help you build up a picture of the types of cars you are likely to be charging in parking spaces, and GIS heat maps can help understand where capacity is needed (no need to put on-street chargers along a line of driveways where people can install their own). All of this can be combined to inform local decisions. Some of these will be clear supply and demand issues, eg ‘EVs are parked here so we need to provide them with charging’. Sometimes investment will need to focus on meeting new needs (eg electric fleets) or incentivising new behaviours (eg out of town parking).

“EV charging deployment can also be used to drive change”, says Sara Sloman, Head of Future Mobility Partnerships at



Elmtronics, an EV charging installer, “We have a chance to use EV roll out to redesign cities, reduce traffic, and improve standards of living. We could change traffic patterns, for example deploying chargers at park and ride alongside new bus routes or bike hire schemes or pushing developers to create community hubs built around chargers near pockets of local services”.

These decisions will differ between regions. In each case, existing parking data from apps and terminals helps you understand your current environment. You can then make informed decisions about whether you want to work with it or change it.



Match charging to how people park

Once you’ve understood where and when people leave their cars – or where you want them to – you need to decide how to match charging capability to those dwell times.

Speed of charge is less relevant than matching charge to dwell time. If cars are in spaces for 10 hours whilst their drivers work or sleep, then a two-hour charge means eight hours of missed opportunity. Spaces where people park for 20 minutes to pick something up will need different solutions to spaces where people park for an hour to do their shopping, and to spaces where people park all day.



Long dwell spaces, e.g., on street private parking may benefit from 7kW chargers to allow charges overnight. Spots where people come for a fast charge may need ultra-fast DC chargers with the ability to dispense at 150kW or even greater.

Some car parks will have multiple use cases (e.g., 70% long stay, 30% short stay) and may need different charging options. Some spaces may contain a single car overnight but several during the day, and so want to offer chargers that have multiple charging speeds and tariffs to benefit different users. Again, parking data can help you make decisions as to what is needed where.



“All this is complicated because vehicles accept charge at different rates,” says David Pearce of David Pearce Electrical, a company which delivers Local Authority EV installations. To convert the AC power to DC, vehicles have an On-Board Charging System, and these differ from vehicle to vehicle. Some max out at less than 7kW and others are capable of receiving 22kW. “The on-board chargers on some vehicles have some electronic restrictions that defy logic”, says Pearce. “For example you would expect a vehicle to re-charge quicker at a 11kW charger than a 7kW unit. But sometimes electronic limitations mean the vehicle receives 3.7kW if connected to a 11kW charger, making the 11kW slower than the 7kW!”.

Don’t underestimate the extremes, for example a Renault Zoe will replenish its driving range at a rate of 22 miles for every one hour of connection to a 7.4kW charger or at a rate of 63 mile per hour when connected to a 22kW charger.

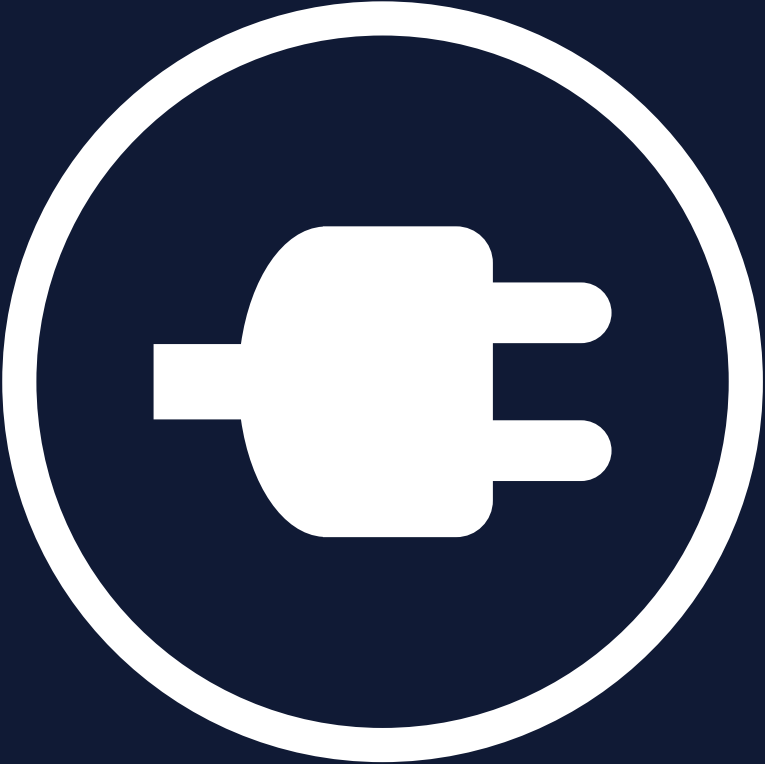
Only 22kW AC chargers can ‘be all things to all vehicles’. The output flexibility of a 22kW unit will ensure that a vehicle receives charge to the maximum ability of the vehicle’s

on-board systems, thus replenishing driving range in the shortest timeframe. “In AC charging, 22kW is by far the preferred solution” Pearce adds, “although 7kW can fit the bill nicely if dwell times are in excess of a few hours”.

It’s important to understand what people expect from their parking, and what the technology solutions are to meet that for different drivers. Most see destination charging as a top up, not a full charge, but they expect enough juice to get them to their next charge point. “It’s all about ensuring that consumer expectations and reality are aligned. At present overall EV charging knowledge is limited, so it is imperative that we educate with total transparency,” says Pearce.



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Give the user a smooth payment journey

The heart of a good user journey is the payment. Think about payment from the point of view of the user, providing options and minimising effort. Make tariffs for parking and charging clear.

Those who pay through their phone do not want to have to download several apps to park and charge. Ideally aim for a single app that lets users book and pay for parking and/or charging through a simple system.

As EVs move from early adopters to mainstream, some may not want to pay with apps at all – some prefer a terminal, others will appreciate one as a backup if they are having phone problems. At Flowbird, we have had a number of conversations with Local Authorities who want payment terminals on streets connected to charge points, where users can simply select their charge, and swipe their card. In the smartphone age, it can be easy to forget that some people find a physical payment terminal easier to use, and not everyone wants to download

an app (let alone several) and share all their data in order to refuel their car.

Providing the suitable range of options for different users via phones or terminals, using card, cash, apps, digital wallet, or subscriptions, will be key to keeping users happy.

Make pricing simple

Users also don't want to navigate complex pricing. But parking and charging will usually have different costs. Some charging may have different tariffs at different times, or options to charge at different speeds depending on the car and dwell time. LAs will also need to deal with blended parking and charging tariffs, which may be an all-in hourly charge for an EV space, or a charge for the energy used, or a charging rate that drops to a parking rate when the charge is finished.

The rate set will depend on goals, e.g., high demand spaces may want to discourage overstay, whilst park and ride spaces may want to incentivise all day parking even if the charge only lasts an hour.

“Key to all of this” says James O'Neill of Paythru, “is a single payment platform capable of integrating multiple end points – including chargers, parking terminals, apps, and connected vehicles – and managing a wide range of complex tariffs across the LA's estate.”

Those truly committed to user centricity can insist all their chargers and payment apps allow 'pooling' whereby the users can stick to their preferred app and use that to access all parking and charging in the area. This requires a backend payment platform that can handle such complexity, charge point providers who follow the Open Charge Point Protocol (OCPP), and some goodwill and collaboration.





Plan to scale according to user need

Demand for chargers will grow gradually and unevenly, bringing trade-offs to the pace of roll out. “There is a balance to strike, between providing adequate allocation of EV charging spaces and making sure revenue isn’t lost through underutilisation,” says Sara Sloman. “No one wants parking spaces empty, but nor do they want to be faced with major upgrades once demand for chargers increases. Scalability and modularity are key to success”,

“Many councils are solving this by putting in the ‘behind-the-scenes’ EV infrastructure on streets and car parks” says James O’Neill, “with all the necessary connectivity to power tens or hundreds of chargers in each location, but just adding a couple of charge point terminals for now. They then include several ‘sockets’ with hot swap covers, so the charge point provider can open and pop in new chargers as the need grows.”

Build to last

Another key element of managed growth is ensuring existing chargers keep working. If

they only last seven years, then you will need to start a replacement programme whilst you are still rolling out new capacity. Too many first wave chargers are now standing idle, or in landfill.

Keeping the complex electronics locked away and then deploying well manufactured end points as need dictates reduces chances of problems, and makes it much easier to upgrade chargers, or quickly replace them with little waste.

Working with a provider that can deliver long term service and maintenance contracts is similarly important to ensuring charge

point infrastructure lasts, and users are not disappointed by broken charge points. Providers who sell you a ten-year service contract will not install kit that is likely to have lots of problems.

It is also important to note that all is not lost for charge points that are not delivering. By setting up a backend platform (such as Flowbird Mobility) to manage your parking and charging, you can bring legacy charge points which meet the OCCP standard into your ecosystem, allowing you to manage and monitor them.

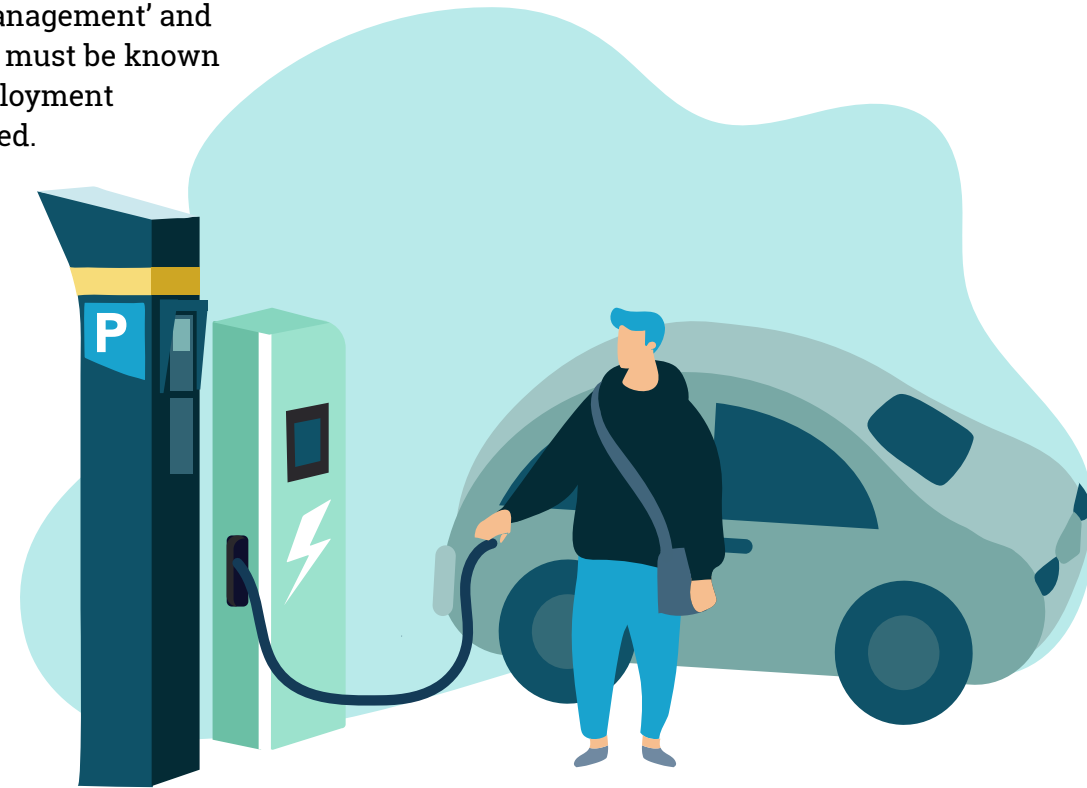
Understand the energy and infrastructure constraints

Existing grid connections will provide some capacity, but above a certain point, upgrades may be needed to transmit enough power. These are big, disruptive projects, so they need to be well planned.

“Any EV deployment will need to calculate the anticipated energy demand and design installation from a loading perspective” says David Pearce. “Lack of energy capacity will mean the chargers cannot deliver in accordance with user expectation.”

The electrical design for an EV charging installation is challenging when trying to balance practically, budget and supply

capacity. In practice it's not as simple as 10 x 22kW chargers will need 220kW of power. Consideration can be given to the likelihood of simultaneous connection, vehicle charging variation, duration of stay, etc. A 'can do' but realistic approach needs to be adopted by the designing engineer. A good understanding of proposed charging products 'load management' and 'queuing' abilities must be known to ensure the deployment is properly planned.



Do everything you can to ensure scaling is easy

Don't invest unnecessarily. An assessment of usage patterns, and car types on the market, can give you an indication of likely average demand and allow you to design energy systems to meet them. Then use load management software to manage delivery on the occasional days load is exceeded. This could either spread capacity evenly or deliver intelligent solutions such as tapering load for long charges.

That said, upgrades will eventually be needed in many locations, and this should be planned for.

“Plan ahead by working with the DNO” says Sloman. “Notify them early of your plans, so that they can advise whether that location has a good electrical capacity. When the time does come to upgrade, put the underground ducting in in one go to meet long term capacity needs so it's easy to add more capacity later without digging things up again”.

“Do everything you can to ensure scaling is easy” says Pearce. “So, if you know you'll need lots of 22kW chargers in future but don't have the electrical supply capacity now, don't just install 7kW chargers and then rip them out a few years later. Install 22kW chargers but restrict output to 7kW for the time being. As demand grows and the cost of grid upgrades can be justified, you can make that investment and remove the restrictions”.



PART 3: CONCLUSIONS

Deploying charging infrastructure is hard. It must factor in locations, future demand and user journeys. It must manage a transition of spaces to parking and charging at the right pace. It needs significant investment in infrastructure to make it all work.

James O'Neill echoes the advice of many of our experts. "Look at your ecosystem, considering your customers and requirements. Use data to conduct an analysis; what cars do you have, what are their parking patterns, what chargers work best, what are the power requirements. How will all this change over time?"

Once you have made decisions, plan for the long term. Deploy chargers that will work. Offer a range of payment options. Establish support and maintenance. Connect everything to a backend management platform that allows you to seamlessly combine chargers with different payment options, design smart tariffs, flag problems to engineers, and maintain clear oversight of your entire estate to help make future decisions as EV use evolves.

There is no universally right approach. The right strategy is to consider what you want to achieve, look at the data in your

area, and consult locally. Engage with industry experts on charge points, parking, installation, energy, and infrastructure, to assess the right approach across your parking estate and design your procurement terms. Then work with partners who can deploy long lasting infrastructure aligned to your residents' evolving needs.



How Flowbird can help

- As the leading parking technology provider, we have years of detailed data on car parking usage and trends to help plan an evolving EVCP roll out aligned to user need
- We are a safe pair of hands, with decades of experience in installation and management of car park infrastructure and payments
- We partner with a range of charge point providers and installers who can deliver the right charge points for different needs
- We offer inclusive cash, card and mobile payment options through apps and terminals which seamlessly integrate with EV charge points
- We offer a tailor-made EV platform, for legacy and new charge points, that allows interoperability between EV Charge Points and terminals and a wide range of payment options. This delivers a smooth user journey through combining parking and charging options, and allows intelligent tariffs to be set.
- We employ and contract a nationwide fleet of experienced maintenance engineers who can ensure rapid repairs and guarantee long lasting EV infrastructure



We would like to thank the following for their contributions

- **James O'Neill**, CEO of Paythru. Formerly COO of Innogy eMobility, E.ON's EV charging business
- **Sara Sloman**, Head of Future Mobility Partnerships at Elmtronics
- **David Pearce**, David Pearce (Electrical Contractors) Ltd
- **Danny Hassett**, Managing Director, Flowbird Urban Intelligence UK



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