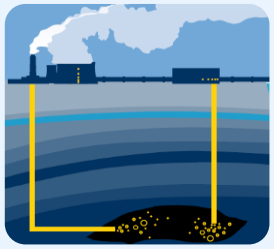








Forest of Dean EV charging consultancy support

Final report

December 2020

Element Energy Ltd

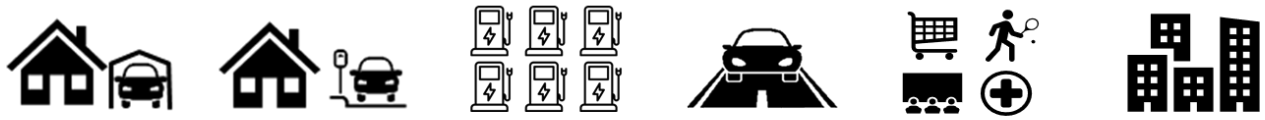
Celine Cluzel, Director
David Garrick, Senior Consultant
Abigail Willis, Consultant

This Forest of Dean EV charging report is split into 7 sections

Assessment of EV charger business case	Assessment of business case associated with different EV charging technologies based on cash flow modelling of different charging speeds, utilisation scenarios etc.	
Comparison of EV charging business models	Comparison of 5 potential business models using SWOT analysis, and a detailed assessment matrix considering aspects such as cost, risk and complexity.	
Council EV charging deployment strategy	Examples of deployment strategies used in Dundee, London and Nottingham and how they apply to FoD Council.	
FoD car park site assessments	Detailed geospatial analysis of 15 car parks to assess their relative attractiveness for EVCP deployment based on a series of relevant metrics. Results shown on FoD-wide and town basis.	
FoD deployment approach	Outline of an indicative 4-phase strategy for deployment, proposing location, speed and number of EVCPs. Supported by estimates of potential costs and revenues.	
Car club adoption discussion	Explanation of the common barriers to shared vehicles adoption generally, and specific barriers for shared BEVs	
Appendix	Supporting material	

Assessment of EV charger business cases
Comparison of EV charging business models
Council EV charging deployment strategies
FoD car park site assessments
FoD deployment approach
Car club adoption discussion
Appendix

The EV charging market can be split into several segments – this study primarily focuses on destination and residential hub charging



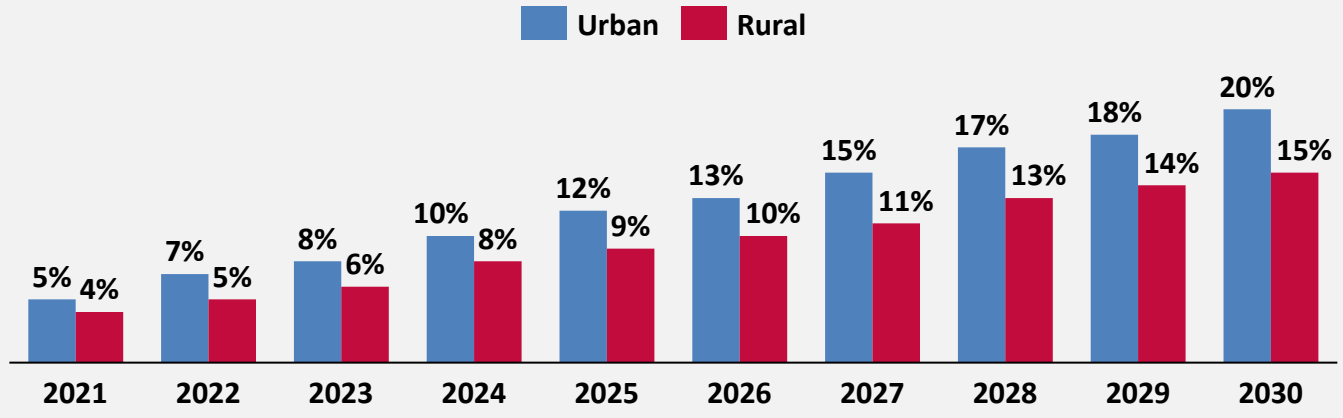
Charging type	Home charging	Residential on-street charging	Residential charging hub	En-route charging	Destination charging	Workplace charging
Use case	Charging at home in a private driveway / garage, or apartment car parking space, typically overnight.	Charging at a public on-street EVCP near to the driver's house, typically overnight	Charging at public EVCPs in the driver's local area. In rapid hub case, quick turnaround means similar model to petrol refuelling.	Charging along major arterial routes or main roads in urban areas. Quick turnaround times.	Charging in car parks at the end of an outward journey. "Top up" charging model.	Charging while parked at workplace. Predictable + long dwell times. Not strictly public charging.
EVs per EVCP	1 EV per EVCP	Small number of EVs per EVCP	Many EVs per EVCP	Many EVs per EVCP	Many EVs per EVCP	Small number of EVs per EVCP
Key user groups	Residents with off-street parking	Residents without off-street parking	Residents without off-street parking, taxis, car clubs etc.	Residents without off-street parking, taxis, car clubs, high mileage company cars	All residents	Employees (particularly those without off-street parking)
Typical location	Driveway, garage, apartment block car park	Along residential street pavement	Along urban roads (not genuine hub), public car park, forecourt, dedicated development on public land	Service station / petrol forecourt and other sites near main roads, e.g. hotel, retail park	Range of car park types, e.g. public car park, supermarket, shopping centre	Employee car park
Typical charging speed	Slow, 3-7kW	Slow to fast, 3-22kW	7-150kW, but more likely 50-150kW (rapid to ultra rapid)	Rapid to ultra rapid, 50-350kW	Slow to fast, 3-22kW (some sectors moving to rapid, e.g. fast food & supermarkets)	Slow, 7kW
Led by	Resident	Council	Council or private sector (depends who owns land)	Council or private sector (depends who owns land)	Council or private sector (depends who owns car park)	Private sector (unless it is Council employee car park)

Less relevant to FoD and therefore not a focus of this study. There may be opportunities to influence through other policies e.g. planning

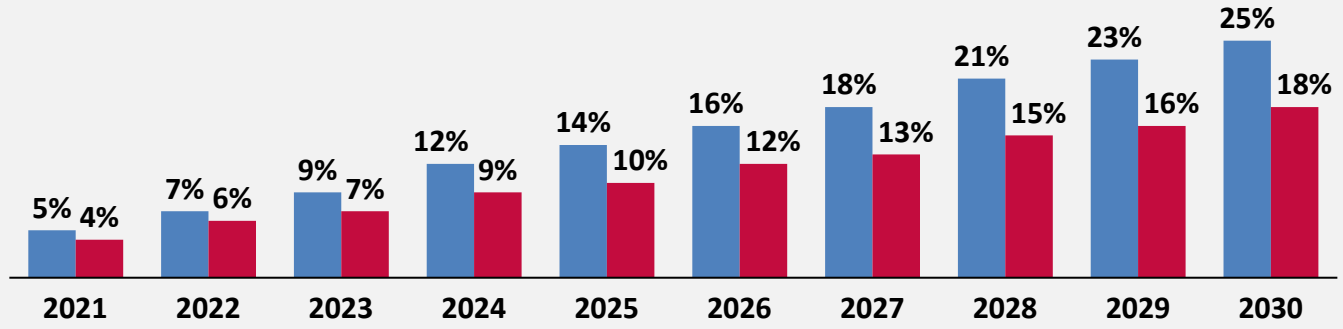
Directly relevant to FoD, often as site manager, and therefore a focus of this study

The projected utilisation of EVCPs is a key uncertainty when assessing the business case of different EV charging technologies

- In order to analyse the business case of different EVCP technologies the future utilisation of these assets must be projected
- There is significant uncertainty around how utilisation will evolve – to reflect this we have tested two scenarios:
  - **Urban:** projection based on EE analysis of real-world charging data to date, modelling of future EV and EVCP deployment, and validation with charge point operators. This is more representative of an urban / city setting.
  - **Rural:** provides a more pessimistic outlook, intended to reflect slower than expected EV uptake and a rural setting.



Projected utilisation of 7-22kW destination EVCPs



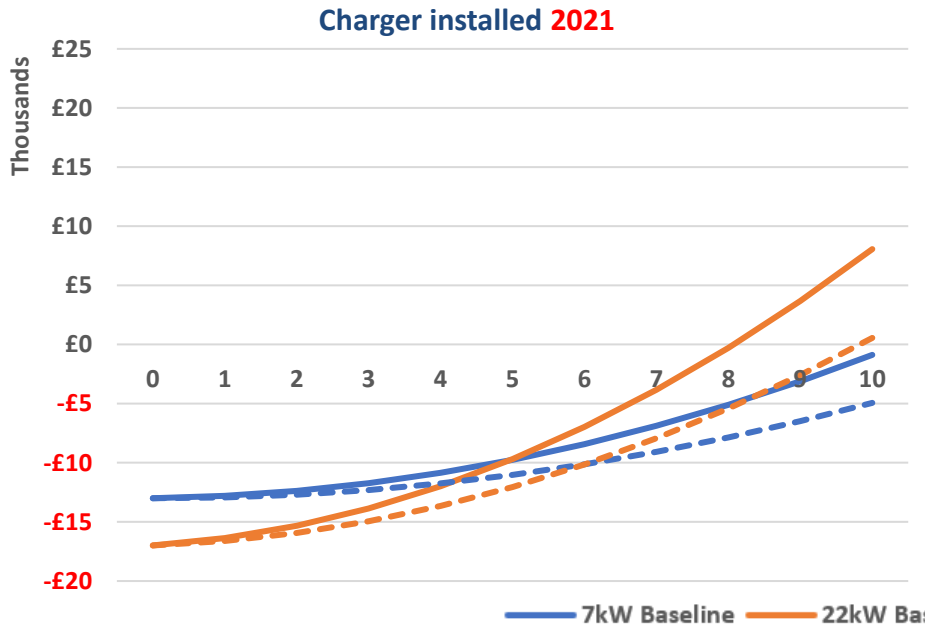
Projected utilisation of 50kW+ destination EVCPs

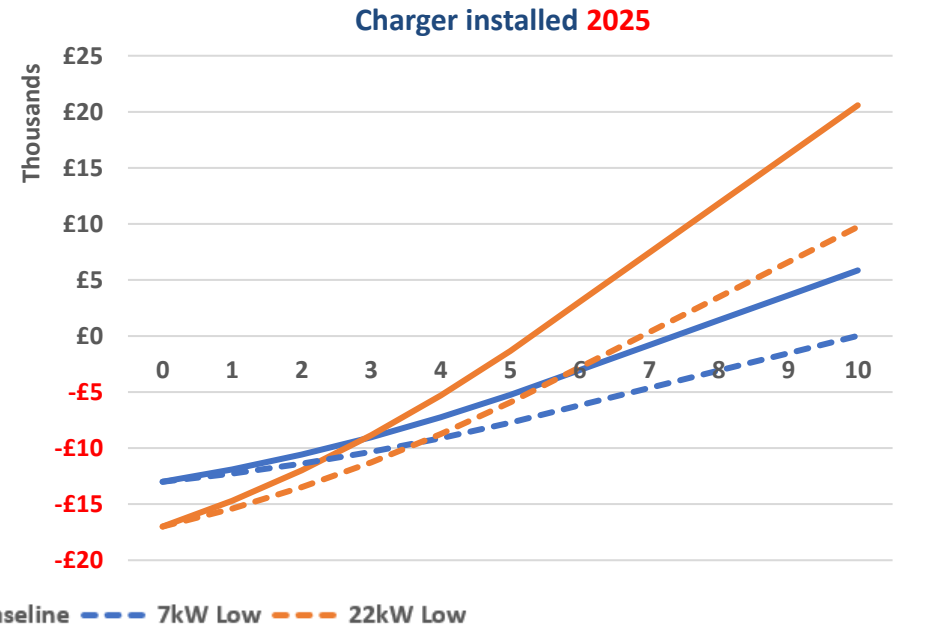
Note: modelling holds utilisation constant from 2030 onwards

Note: Utilisation defined here as delivered energy as a share of max theoretical delivered energy based on 24/7 EVCP availability

B2C Business case assessment: 7kW & 22kW chargers

Non-discounted cumulative cash flows for slow & fast chargers





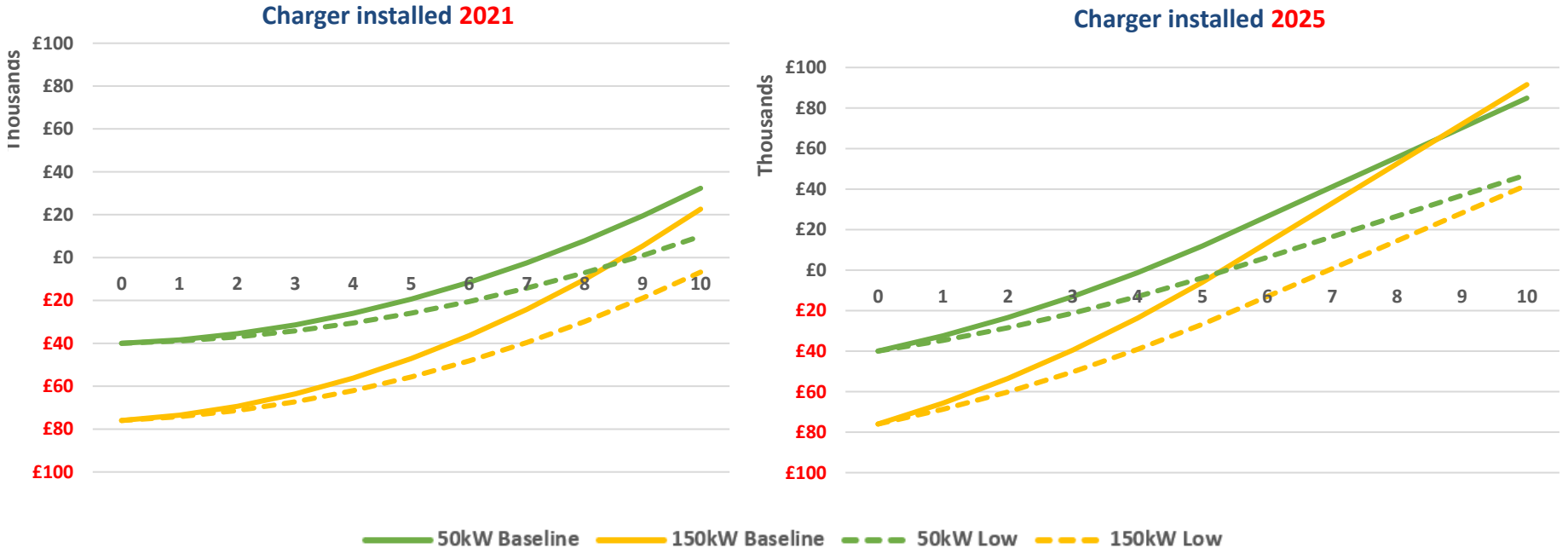
7kW Baseline — 22kW Baseline — 7kW Low — 22kW Low

- Overall, the current business case for slow and fast EV chargers is challenging
- In the urban scenario, a 22kW charger installed in 2021 can break even in 8 years but is only just able to break even within 10 years in the rural scenario. It is expected that by 2025, 22kW chargers could achieve a 5-year payback in the urban scenario and 7-year payback in the rural scenario, reflecting a more attractive investment
- Traditional 7kW devices have a particularly unattractive business case which explains gradual shift away from these devices – the significant share of 7kW chargers now installed are on-street lamppost EVCPs (these typically have charging speeds <7kW)
- The 2021 cash flow modelling shows that 7kW chargers are unable to payback the initial outlay within 10 years in both scenarios due to the limited amount of energy that can be delivered, by 2025 7kW chargers achieve a more reasonable 7-year payback
- As a result of the 2021 business cases shown above, 7kW chargers tend to be fully funded while 22kW chargers are part-funded

Note: annual grid costs not included. 22kW device assumed to have 2 Type 2 connectors, each drawing maximum of 11kW (based on observed EV capabilities). 7kW device assumed to be 2 Type 2 connectors which can be used simultaneously.

B2C Business case assessment: 50kW & 150kW chargers

Non-discounted cumulative cash flows for rapid & ultra-rapid chargers



- The business case for rapid and ultra rapid devices is more attractive than for slower devices
- In the urban utilisation scenario, 50kW chargers installed in 2021 would achieve payback around year 7, and reach a cumulative cash flow of ca. £30k by year 10
- In the rural utilisation scenario, the 2021 rapid chargers are shown to payback in year 9
- As utilisation grows with EV uptake, the business case improves with the cash flows showing that 50kW+ chargers installed in 2025 will have a simple payback period of less than 5 years in the urban case, and around 5-6 years in the rural scenario
- The outputs above explain why the level of public funding support in Council-led rapid charging deployments is decreasing and, in some cases, the private sector is fully funding 50kW+ chargers in return for long-term lease agreements

Note: annual grid costs not included. Modelling assumes average EV receives 40kW from rapid & ultra rapid devices in 2021 and 50kW in 2025. This may be a relatively conservative assumption for 150kW charger usage.

Assessment of EV charger business cases

Comparison of EV charging business models

Council EV charging deployment strategies

FoD car park site assessments

FoD deployment approach

Car club adoption discussion

Appendix

Various EV charging business models have been assessed

Brief overview of the EVCP business models

- **Own & Operate:** Council plan, own and operate the network and are responsible for maintenance. They retain all revenue and pay for hardware / software support in order to run the network. Council choose where EVCPs are installed and sets tariffs. *Note that this is generally not a preferred approach these days.*

- **External Operator:** Essentially Own & Operate but engage a 3rd party CPO contractor to provide a full O&M service, alleviating the Council of this responsibility

- **Private sector match funding:** Specific case of using government grant schemes, which typically provide 75% funding, to deploy EVCPs. CPO funds remaining 25%, and the two parties negotiate arrangements around ownership of network. CPO will take on full O&M responsibilities

- **Concession agreement:** These vary from Council to Council. Supplier and Council agree a split of capital costs, ownership and risks. Supplier typically takes on full O&M responsibility. Council will receive a revenue share. Typically used to deploy relatively high EVCP volumes.

- **Lease arrangement:** Supplier funds, owns, operates and maintains the EVCPs. This service is leased to the Council based on a long-term agreement. Council may be able to negotiate ownership of below-ground infrastructure. Suppliers will target attractive locations.

All the business models presented can be used to deploy fast & rapid charging – a summary of the typical cost breakdowns is provided

	CAPEX			OPEX				
Fast & rapid charging business models	Hardware	Install	Ground & Grid	Back office	Electricity	Maintenance	Revenue	Contract length
Own & Operate[1]	Council	Council	Council	Council	Council	Council	All to Council	-
External Operator	Council	Council	Council	Supplier	Council	Supplier	Majority to Council	-
Private sector match funding	Typically split Council (or Gov) 75% and supplier 25%			Supplier	Supplier	Supplier	Varies	Varies
Concession: Bham	Council	Supplier	Supplier	Supplier	Supplier	Supplier	Share to Council	ca. 5-10 years
Concession: Notts	Supplier	Council	Council	Supplier	Supplier	Supplier	Share to Council + significant min. payment	
Concession: London	Supplier	Supplier	TfL or LA	Supplier	Supplier	Supplier	Share to TfL or Council	
Lease model[2] (rapid)	Supplier	Supplier	Supplier	Supplier	Supplier	Supplier	Share to Council	15-25 years

- It should be noted that it is assumed **Council cost components would typically come from national funding schemes** (e.g. OLEV)
- Concession contracts appear to be increasingly common for LA rapid charging installations - these vary in terms of the share of upfront costs covered by the supplier, but are typically used where suppliers are confident of profitability and deployment scale
- The concession arrangements shown highlight the different approaches that have been negotiated by Councils

1. LA would invest in hardware and software support
2. Model can be flexible, e.g. LA retain ownership of ground and grid works and electricity (everything behind the EVCP)

The slow charging business case is typically very poor; hence the business models typically remove capital risk from the supplier

	CAPEX			OPEX				
Slow charging business models	Hardware	Installation	Ground & Grid	Back office	Electricity	Maintenance	Revenue	Contract length
Own & Operate[1]	Council	Council	Council	Council	Council	Council	All to Council	-
Service Contract	Council	Council	Council	Supplier	Council	Supplier	All to Council, pay supplier service fee	1-5 years
Concession contract	Council	Council	Council	Supplier	Supplier	Supplier	Share to Council	5-10 years
Private sector match funding	Typically Council (or Gov) 75% and supplier 25%			Supplier	Supplier	Supplier	Varies	Varies

- As shown previously the business case of public slow charging is typically very poor
- As a result, suppliers tend to avoid paying capital costs where possible – these are paid with a combination of government grants and in some cases Council funds
- Local Authorities typically retain ownership of the network, with the supplier either funding all O&M and taking the revenue (with a share going to the Council), or the Council engaging the supplier on an O&M service contract and taking the revenue

1 – in Own & Operate, it is assumed the Council would pay a Charge Point Operator to deal with O&M

Comparison of EV charging business cases

Increasingly attractive to Council

Assessment metric	Own & Operate	External Operator	Private sector match funding	Concession	Lease
Capital required					
Asset ownership risk					
Risk of poor value for public investment in a low usage scenario					
O&M responsibility					
Potential returns for Council					*Assuming good sites and contract terms*
Length of land lease					
Control of EVCP siting			*Depends on the agreement and volume of EVCPs being installed under contract*		
Control of tariff pricing					
Technical complexity for Council					
Contractual complexity					
Dependency on supplier business case					
Range of charging speeds available					

Note that this assessment is most relevant to deploying EVCPs that are 22kW and above. For slow EVCPs, the business model options are more limited, and the choice would be largely driven by the nature of funding used

Note: full SWOT analysis is found in the appendix

Based on the assessment carried out, we have considered how well each business model would suit Forest of Dean Council

	Own & Operate	External Operator	Private sector match funding	Concession	Lease
Overall assessment	High risk and very resource and capital intensive – unlikely to be attractive option	O&M de-risked. If Council has appetite for asset ownership and associated risk this could be attractive option but is capital intensive	De-risked approach that could deliver a range of charging speeds and may offer groundworks ownership. This is a promising option for FoD if grant funding available	De-risked approach with good revenue share but so far suited to city cases with high potential profitability and EVCP volumes – may be difficult to set up in FoD	Fully de-risked option which is quick and simple to set up. If FoD can agree to the lease lengths required and supplier willing to install at desired car parks - would be attractive option

- It is important to note that further work will be required in order to determine the business models available in FoD and for the Council to finalise its preferred option. FoD should continue to assess the deployment opportunities and engage with suppliers to establish what approach best suits the Council's ambitions, constraints etc.
- However, our initial assessments shown above are based on:
  - Limited resource available and limited appetite for risk
  - Utilisation will be relatively low due to general EV uptake to date and the rural FoD setting
- Based on these assumptions and initial discussions with the FoD Council the most suitable business models at this early stage appear to be 'Lease' and 'Private sector match funding'.
- Lease model suitability will depend on what length of land lease FoD find acceptable – this should be discussed further internally before a final decision can be made with regard to this approach.

Note: it appears that private sector match funding has been used in Canterbury

Assessment of EV charger business cases

Comparison of EV charging business models

Council EV charging deployment strategies

FoD car park site assessments

FoD deployment approach

Car club adoption discussion

Appendix

We have assessed the public EV charging strategies of three cities, all of which contain elements that are relevant to Forest of Dean

City	No. of EVCPs	Summary of approach so far	Key target groups	Plans for future
Dundee	ca. 100	• EVCP strategy integrated into overall transport strategy, aiming to reduce overall car use • Maximising use and integration renewable power • Strong communication campaign	• Taxis primarily, but also businesses	• Developing strategy for residents without off-street parking • Explore MaaS[1] within the region and other forms of EV transport (intercity coaches)
London	ca. 9,000	• Two key procurement frameworks: on-street and rapid. • Informed by extensive research into charging behaviour, economic models and site analysis • Extensive stakeholder engagement (Taskforce)	• Taxis, PHVs, car clubs • Residents without off-street parking	• Moving towards a focus on rapid hubs, with a broad target group (high mileage users, residents, fleets) • Innovative on-street models to be explored
Nottingham	ca. 400	• Targeting fast and rapid charging at car park locations – both public and private sites • Majority of EVCPs delivered by concession framework (used by other local Councils)	• All users – no specific targets	• Continue targeting rapid deployment and growing network at car parks • Wireless charging trial for taxis

1: Mobility as a service.

Note: Framework example in appendix

Dundee has developed an impressive hub-based strategy, enabled by significant public funding

Dundee

Dundee focused on strategic groups and has evolved strategy as new opportunities arise

- Dundee's strategy, developed 10 years ago, has focused on achieving long-term goals for the city, such as reducing the number of cars entering the city centre and improving air quality.
- Taxis are viewed as part of the city's long-term transport solution, so **EV strategy has focused on providing rapid hubs.**
- Installing **chargepoints in the city centre or on-street has been avoided**; driving into the city centre to charge is not in-line with their long-term transport strategy.
- Dundee runs **major local media campaigns** and has seen **accelerated EV uptake** as a result.
- **All charging infrastructure installed in the city is owned by the Council**; possible because of significant financial support from the Scottish Government.
- Public money also covers electricity and maintenance costs
- Access to **network was initially free, with a tariff introduced in 2019.** Dundee City Council have faced PR challenges introducing a fee and advise against offering free charging.

Existing procurement frameworks weren't detailed enough, so Dundee developed their own

Developed framework

Need to know what sort of network you want. Dundee framework centred around hubs and informed by significant research.

Framework launched

17 responses were received. Each was evaluated on 65:35 quality to cost basis. Framework required:

- Detailed cost breakdown of every element needed to build a hub (building materials, chargepoint, solar PV etc)
- That all chargepoints connect to the ChargePlace Scotland backend
- 2 case studies of installing a charging hub
- Outline of media and communications strategy

3 suppliers were selected to be on the framework

Users of the framework can run project-specific competitions between them.

swarco SSE SIEMENS

A mix of dedicated and car park charging hubs offer a range of charging speeds and now cater for multiple user groups

Dundee

3 rapid hubs have been installed at major intersections of trunk roads leading into the city

- **Locations were picked to maximise use** by target groups (taxis, and secondarily commuters), without drawing drivers into the city centre to charge.
- Each hub has **6x50kW rapid chargers and 3-4 fast 22kW chargers.**
- Two of the hubs have solar PV canopies that provide up to 36kW power to the hub, and one hub has 90kWh of battery storage installed. Both of these measures help minimise power drawn from the grid.

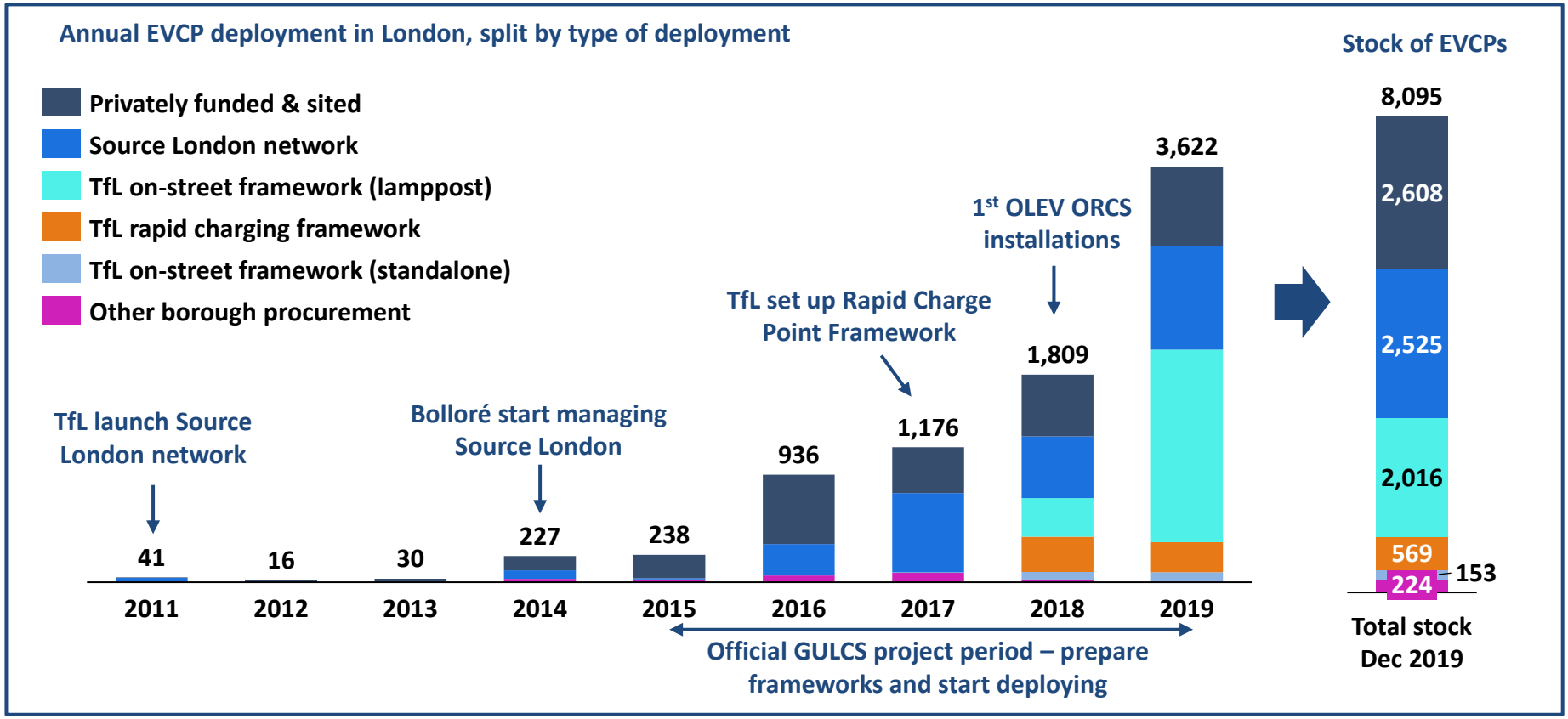
Fast charging hubs in multi-storey carparks are also being installed

- The three main multi-storey **car parks in Dundee are having hubs installed** on their roofs. In total 60 fast charge point connections will be available.
- Each site uses solar PV and dynamic load management.
- It is intended that **commuters will charge here during the day,** and **residents will charge at the hub overnight**.
- Anecdotal evidence is that residents without off-street parking are charging in these hubs

Key takeaways: this is a heavily subsidised model made possible by significant Transport Scotland funding. However, the hub-based approach aligns with FoD's needs and shows an example of demand-led car park charging now catering for a range of user groups.

London's network highlights the importance of funding support - ca. 70% of public EVCPs were deployed through public procurements & frameworks

London



GULCS = Go Ultra Low City Scheme, OLEV = Office for Low Emission Vehicles, ORCS = On-street Residential Chargepoint Scheme

Source: EE analysis of 2019 data

London's EV charging strategy has been informed by a significant volume of research into the needs of specific user groups

London

Strategy development

- EV charging strategy has been developed and refined over ca. 10 years
- Difficulties faced in first deployment, a network called Source London (2010 – 2014), led to Transport for London (TfL) undertaking **significant volume of research / analysis to shape the its future strategy**
- **Research looked at:** barriers to uptake of commercial EVs, car club ULEV options, charging options for those without off-street parking, mapping EVCP sites for fleets, rapid charging best practice study, consumer research
- Set up London's EV Infrastructure Taskforce – brought together **wide range of stakeholders**. Held **workshops with key user groups:** taxi drivers, car OEMs, EVCP manufacturers, CPOs, car clubs etc.
- **Taskforce key conclusions:**
  - *Rapid charging focus should be hubs – aimed at primarily high-mileage/business users*
  - *For slow/fast - focus is on increasing volume, reducing streetscape impact and exploring new off-street models (e.g. car parks in or around residential areas)*

Technologies & siting

- **Rapid EVCPs has been the focus for fleet users** (taxis, car clubs etc.)
- **Siting rapid EVCPs is demand-led** rather than target-led. London's 1st phase of deployment showed that **poorly located EVCPs result in very low utilisation**
- TfL or Boroughs **identify and pre-prepare the rapid EVCPs sites** (grid work, ground works etc.) ahead of tender process
- **TfL focus is now on rapid hubs** (6 EVCPs or more) – carrying out comprehensive assessment of ca. 500 potential sites based on detailed demand analysis, to decide which to progress / develop
- For the residential setting, **significant volume of lamppost chargers (ca. 2,000) were installed** over 2 years – **efficient way of deploying but not scalable** (can only install were suitable lampposts exist)
- **TfL's approach to residential charging appears to be shifting away from lampposts** – instead, other innovative on-street technologies are being trialled and assessed which would be more scalable and enable smart charging / load management (e.g. Trojan), and they plan to explore new models for residential areas (as per Taskforce recommendation) like hubs

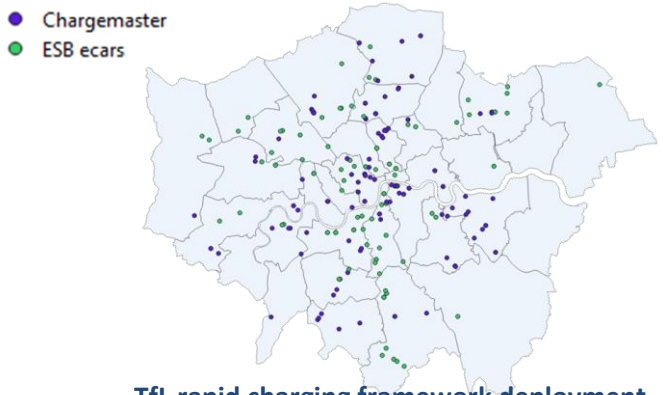
Note: see detailed timeline of London's EVCP deployment in the appendix

London's latest procurement frameworks address learnings from previous deployments and reduce the time / cost burden for boroughs

London

TfL Rapid charging framework:

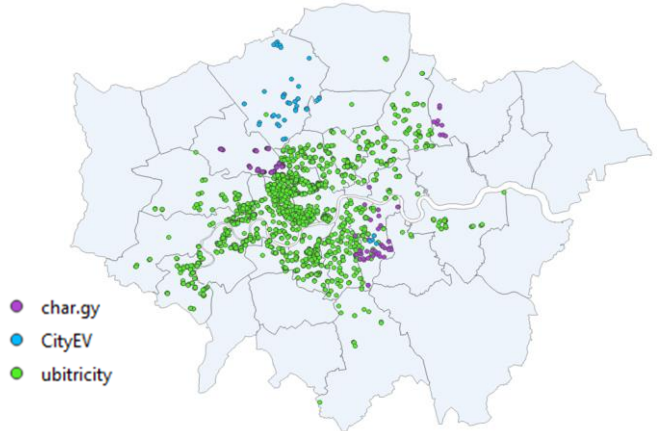
- Concession framework with 5 suppliers
- Individual Boroughs use call-off contracts to deploy EVCPs, these are 8 years + 2-year extension option
- Borough / TfL responsible for preparing the sites, supplier is responsible for the financing, installation, operation and maintenance of the charge points
- Public funding used specifically for finding suitable sites and preparing them (connection and grid upgrades) – 2 key barriers to effective rapid EVCP deployment identified through previous projects
- Supplier takes revenue from operating the EVCPs and Borough receives a revenue share



TfL rapid charging framework deployment

On-street slow charging framework:

- For EVCPs <22 kW, split into 2 lots: shared power supply (e.g. lamppost) and dedicated power supply (traditional pole / wall mounted EVCP)
- Borough accessing the framework can use either: concession contract (5-10 years, most popular) or service contract (1-5 years, suited to fleet charging projects)
- The framework includes procurement specs, instructions, contract terms & conditions, pricing template and evaluation framework - this mitigates a potential lack of expertise / capacity within boroughs to develop these documents and encourages consistency
- Concession contract arrangement:
  - CAPEX – 75% central government, 25% borough (Borough owns the network)
  - Supplier funds all operation & maintenance
  - Supplier takes revenue, and passes on a pre-agreed share to the borough



TfL on-street (lamppost) framework deployment

Key takeaways: The TfL rapid approach is resource heavy and the procurement method may not suit FoD due to the difference in site quality. However, the slow charging procurement approach would translate to FoD if this type of charging was selected (assuming private sector funded the remaining 25%). Note that current OLEV on-street fund can be used for car parks **used by residents** . The London experience shows that it is important to properly assess sites and target those with the highest demand potential in the early deployment stages. Furthermore, London is another example of a strategy increasingly focussed on hub-based charging, which aligns with FoD.

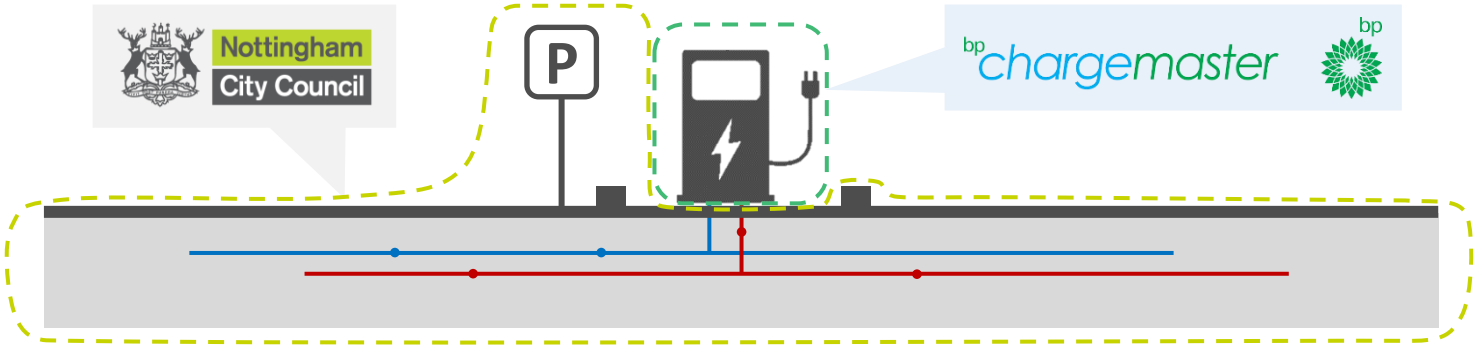
Note: deployment maps reflect the situation in Feb 2020.

The concession framework created by Nottingham City Council minimises risk and ensures they retain ownership of everything “behind the charger”

Nottingham

Under the concession contract NCC designed, the concessionaire is responsible for purchasing and installing the chargepoints at agreed locations and can submit claims to draw down capital from the OLEV funding to cover installation costs. In return for providing funding for installation, NCC receives a significant fixed payment for each chargepoint regardless or performance, as well as a percentage revenue share.

How the ownership of assets is distributed between the concessionaire and local authority



The concessionaire owns the chargepoint and management systems, but NCC retains full ownership of site agreements and below-ground infrastructure. At the end of the contract, if requested by NCC, the concessionaire is responsible for the removal of charging infrastructure at their own cost and ‘making good’ the groundworks. This minimises the risk of the council inheriting any stranded-assets, and they instead retain the grid connection and site which can be utilised for a newer chargepoint.

The concession contract was awarded to bp Chargemaster after an open competitive tender

Nottingham

The concession contract was awarded to BP Chargemaster after an Official Journal of the European Union competitive tender.

As part of the contract, Chargemaster were required to install **230 fast and rapid (min 45kW)** chargepoints across the D2N2 region. Chargemaster also offered to install an **additional 50 rapid chargepoints** at no cost to the local authorities.

NCC went with a **fully managed solution**, whereby the supplier will supply, install, maintain, and operate the network, as this approach minimises risk to the local authorities.

Potential locations for chargepoints were identified collaboratively by bp Chargemaster and the local authorities. Priority locations included:

- public transport interchange points;
- key destinations (car parks, supermarkets, retail centers, business parks, education centres);
- strategic locations (key radial routes into Nottingham, Derby and at East Midlands Airport).

Tariffs are competitively priced within a band agreed with the council, which offer residents and taxi drivers preferential rates*.

Tender timeline

- Nov 2015, finalized tender specification
- Dec 2015, tender invitations open
- Feb 2016, evaluation of tenders
- March 2016, contracts drawn up and suppliers in place

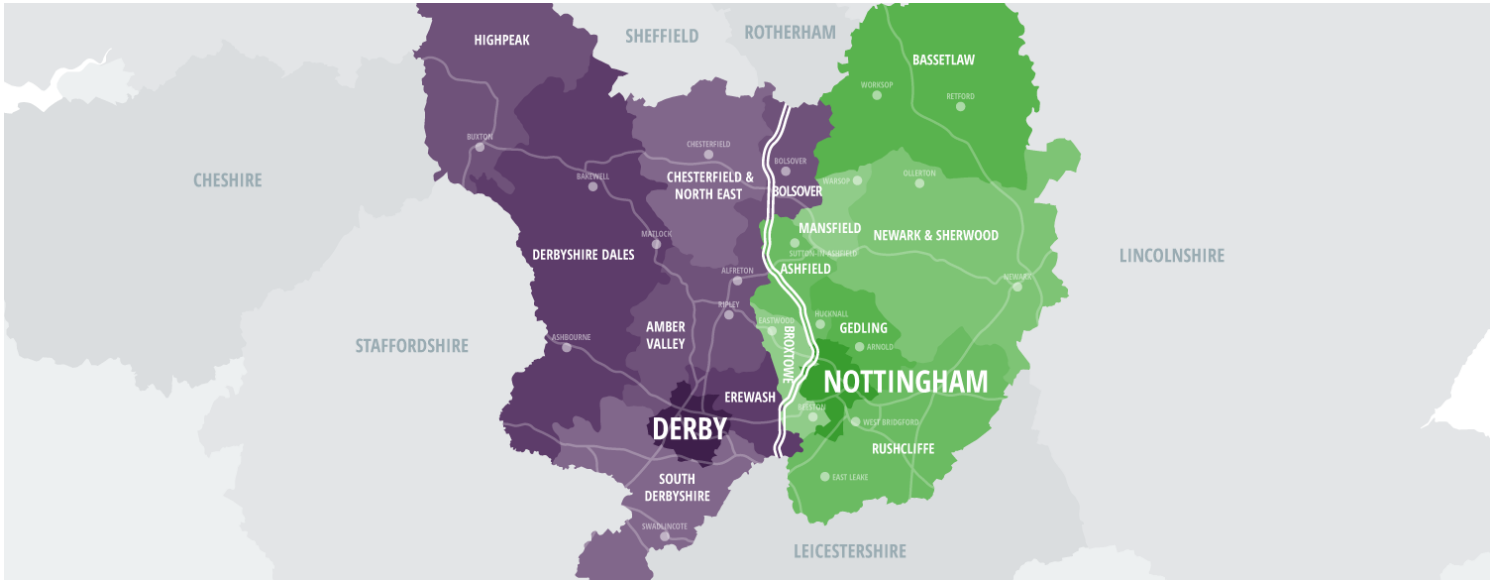
Key framework details

- Framework length: 10 years, with 5+5 year call-off contracts
- NCC retains minimum guaranteed payment and revenue share
- bp Chargemaster owns chargepoints
- NCC owns all below-ground infrastructure and site agreements
- bp Chargemaster is responsible for removing obsolete chargepoints and 'making good' the groundworks

*D2N2 residents can access the network at 20p/kWh, with an annual £20 fee. Polar members are also able to access the network, but at a rate of 12p/kWh with a monthly £7.85 fee (more expensive up to 75kWh/month)

The concession framework designed by NCC can be accessed by surrounding Local Authorities

Nottingham



- The network covers four different local authorities but is managed by Nottingham City Council (NCC). For smaller local authorities, this model can provide them with a fully-funded, fully-managed network at their choice of location, without having to provide any capital investment.
- Within this scheme, the lead local authority (in this case NCC) retains the minimum guaranteed payment and is responsible for organising the concession contract.
- Other local authorities within the framework can 'call-off' from the framework and take ownership of chargepoints within their boundaries, retaining the minimum guaranteed payment, but they will then need to take on the administrative and financial responsibilities of the network.

Key takeaways: setting up a Nottingham-style framework would be resource intensive and may not be attractive to a supplier due to the limited potential deployment volumes in FoD. However, retaining ownership of site agreements and below-ground infrastructure, which can be used for EVCP replacements in the future, would be a sensible aim for FoD. Accessing an existing procurement framework, like the smaller LAs around Nottingham, would be an efficient way of deploying EVCPs in FoD's car parks.

Assessment of EV charger business cases

Comparison of EV charging business models

Council EV charging deployment strategies

FoD car park site assessments

FoD deployment approach

Car club adoption discussion

Appendix

We have used a 3-stage process to assess the relative attractiveness of 15 FoD car parks for EVCP deployment

Assessment metric measurements

- Data relating to 8 relevant assessment metrics collected for FoD
- Measurements taken for all metrics at each car park, based on suitable method
- For example:
  - Amenities within 500m
  - Car parking spaces available
  - Etc.

Define metric scoring

- Assign thresholds for 1, 2 and 3 points for each metric
- Thresholds chosen based on the number of sites falling into each score category
- Generally aim for:
  - 20% score 3 points
  - 40% score 2 points
  - 40% score 1 point

Weighting and overall score

- For each site work out the individual metric scores
- Apply suitable weighting to each metric (shown next)
- Sum the weighted metric scores to give an overall site assessment score out of 3

The combination of metrics assessed indicate the relative EV charging demand potential at the different car parks

Metric	Rationale
Number of parking spaces	Deploying EVCPs in car parks with a higher volume of spaces is preferred as there is less impact to non-EV drivers. These would also have higher long-term deployment potential. Higher number of spaces → high score
Total trips in MSOA (based on DfT model)	The estimated number of car trips occurring daily in an MSOA shows the volume of vehicle activity in the area which in turn is correlated with EV charging demand. More trips → higher score
Traffic flow on nearest major road	Sites with a high nearby throughput of vehicles are expected to have a higher demand for charging, particularly as EV uptake increases. Higher traffic flow → higher score
Distance to nearest major road	Sites that are closer to a major road would be more attractive as they are nearer to the high throughout of vehicles and it is more convenient / likely for drivers to charge there. Closer to major road → higher score
Amenities within 500m[1]	Amenities are shown to attract drivers to EVCPs, and the volume of local amenities is shown to correlate with EV charging demand. More amenities → higher score
Car park utilisation[2] (FoD data)	Car parks that are used more and have more reliable throughout of vehicles are likely to have higher and consistent demand for charging. Higher utilisation → higher score
EV uptake to date (no. of EVs in postcode district)	A high volume of EVs in the surrounding area would tend to indicate local charging demand. Higher EV uptake → higher score
Availability of off-street parking	Residents without access to off-street parking will be reliant on public charging such as those in car parks. Lower availability of off-street parking → higher score

Note – in the weighting scenarios, off-street parking and EV uptake are weighted low relative to other metrics. This is explained below:

- Off-street parking weighted lower due to generally very high availability of off-street parking and low disparity between areas. It is assumed that local residents would not be significant user group, as they would be charging at home
- EV uptake weighted lower due to the early-stage nature of EV deployment to date, and the fact that as mentioned above, the vast majority of EVs owned in FoD would have access to home charging

1. Assessment considers supermarkets, convenience stores, cafes, fast food restaurants
2. Utilisation based on 9 car park inspections between 10/08/2020 – 15/10/2020. Cars parked divided by no. of spaces

Three scenarios have been developed with different weighting of the assessment metrics

	Assessment Metrics	Weighting		
		Baseline	Traffic	Car park size and usage
Traffic	**Total trip-end**	12.5%	20%	10%
	Traffic flow	12.5%	20%	10%
	Distance to nearest road	10%	10%	5%
Car park size & usage	**Total parking spaces**	17.5%	13%	25%
	Carpark utilisation	17.5%	13%	25%
	Amenities	20%	15%	15%
	% Without off-street	5%	5%	5%
	EV Uptake	5%	5%	5%

1) Baseline

- The baseline scenario weights 3 key assessment criteria ; '*Traffic*', '*Car park size and usage*' and '*Amenities'* broadly equally:
  - '*Traffic volume*' and '*Car park size and usage*' are each weighted at 25% and are made up of multiple metrics.
  - '*Amenities'* is weighted 20%.
- EV uptake and off-street parking have a low weighting (5%) for all scenarios (reasons explained on previous slide)

2) Traffic volume Scenario

- In the *traffic scenario*, metrics measuring traffic volume are weighted more highly
- These metrics are '*Total trip-end*', '*Traffic Flow*' and '*Distance to nearest road*', and their combined weighting is 50%
- This scenario highlights sites with high vehicle throughput in surrounding area, and may indicate attractive opportunities for en-route charging for people passing through FoD

3) Car park size & usage scenario

- In the *Car Park size and Usage scenario,* metrics measuring car park size and utilisation are weighted more highly
- These metrics are weighted 50% between them
- Sites with higher car park usage and high number of spaces are likely to have a higher turnover of vehicles and so a higher demand.

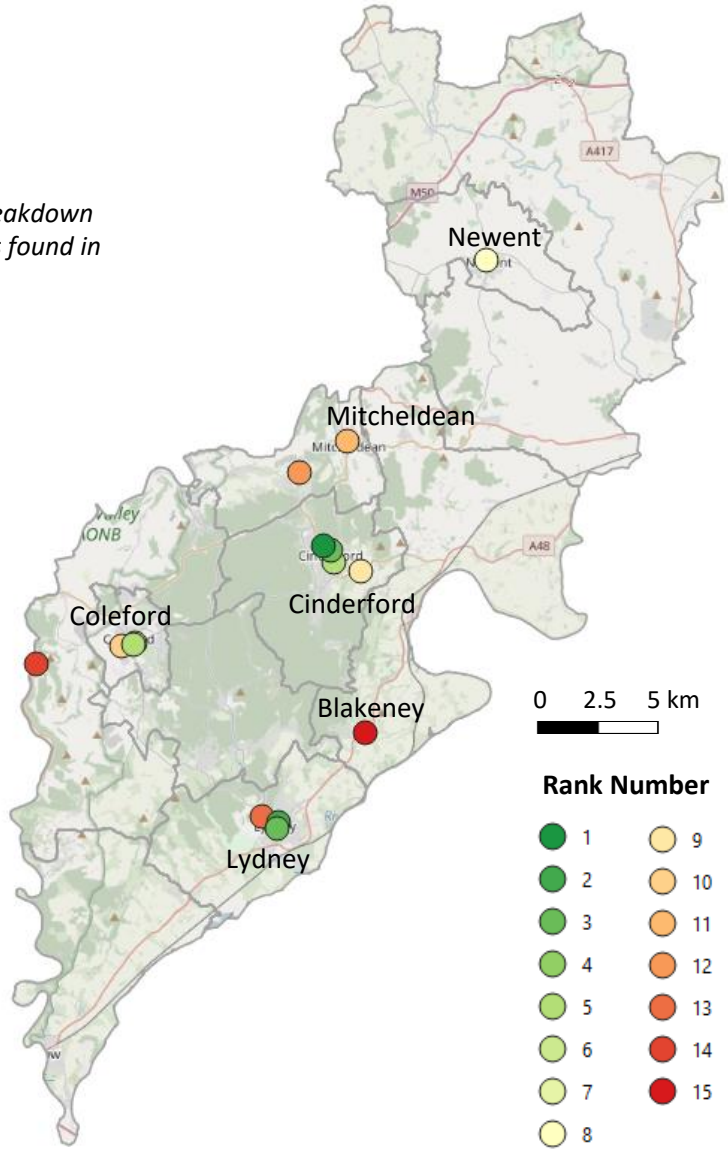
In the baseline scenario car parks in in Cinderford and Lydney have the highest overall score

Car Park Overall Score and Ranking

- Based on the assessment process, an overall score has been derived for each car park and colour coded on the map and in the table.

Town	Car park	Overall Score	Rank
Cinderford	Rowandean	2.15	1
Lydney	Newerne Street	2.125	2
Lydney	Swan Road	2.05	3
Cinderford	Heywood Road	2.05	3
Cinderford	Belle Vue Road	1.975	5
Coleford	Lord's Hill	1.975	5
Coleford	Railway Drive	1.975	5
Newent	Lewell Street	1.9	8
Littledean	Grange Lane	1.825	9
Coleford	Newland Street	1.8	10
Mitcheldean	High Street	1.6	11
Drybrook	High Street	1.475	12
Lydney	Bream Road	1.45	13
Redbrook	Riverside	1.325	14
Blakeney	Butlers Mead	1.2	15

Note: detailed breakdown of metric scores is found in the Appendix



- The baseline scenario ranks carparks in the towns of Cinderford and Lydney highest and Redbrook and Blakeney lowest.

Note: GL14 postcode has over 4,000 registered EVs – assumed to be fake hotspot caused by a company / fleet registering vehicles there. Corrected by applying average of other postcodes – 47 EVs

In the traffic scenario the highest scoring car parks are all in the town of Cinderford

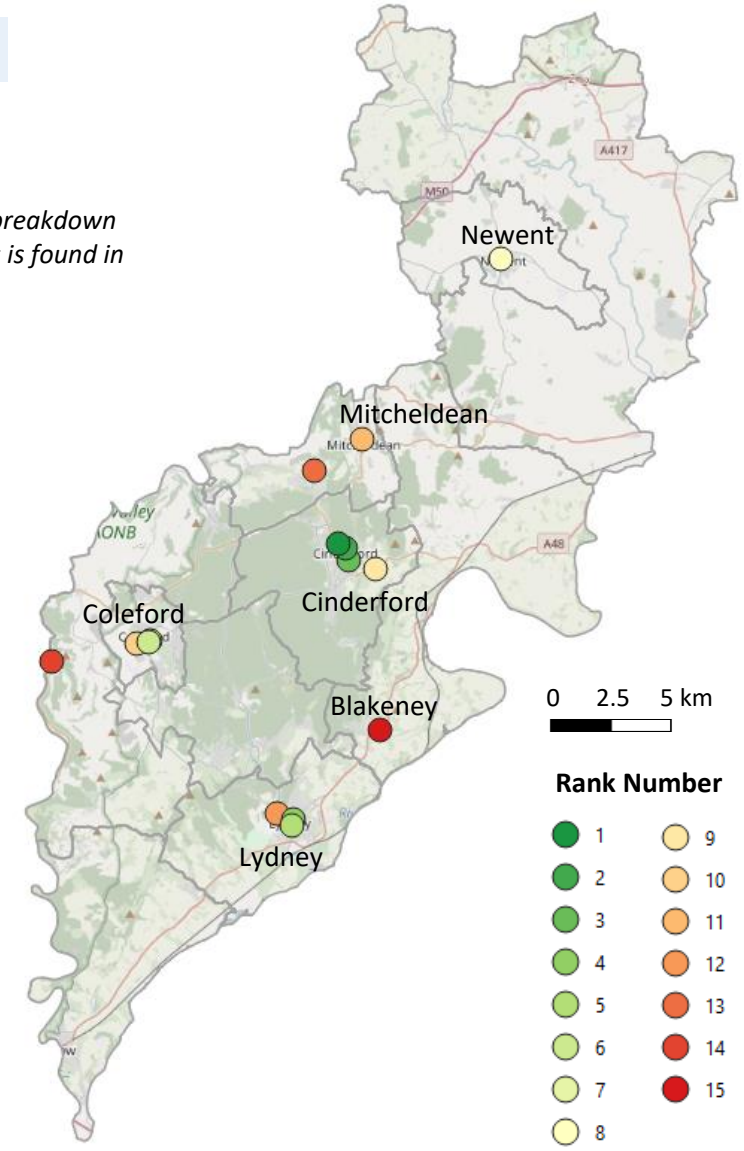
Car Park Overall Score and Ranking

- Based on the assessment process, an overall score has been derived for each car park and colour coded on the map and in the table.

Town	Car park	Overall Score	Rank
Cinderford	Rowandean	2.35	1
Cinderford	Heywood Road	2.25	2
Cinderford	Belle Vue Road	2.225	3
Lydney	Newerne Street	2.0	4
Lydney	Swan Road	1.975	5
Coleford	Lord's Hill	1.925	6
Coleford	Railway Drive	1.925	6
Newent	Lewell Street	1.9	8
Littledean	Grange Lane	1.875	9
Coleford	Newland Street	1.8	10
Mitcheldean	High Street	1.575	11
Lydney	Bream Road	1.475	12
Drybrook	High Street	1.45	13
Redbrook	Riverside	1.275	14
Blakeney	Butlers Mead	1.2	15

Note: detailed breakdown of metric scores is found in the Appendix

- The Traffic scenario ranks all car parks in Cinderford highest and car parks in Redbrook and Blakeney lowest.



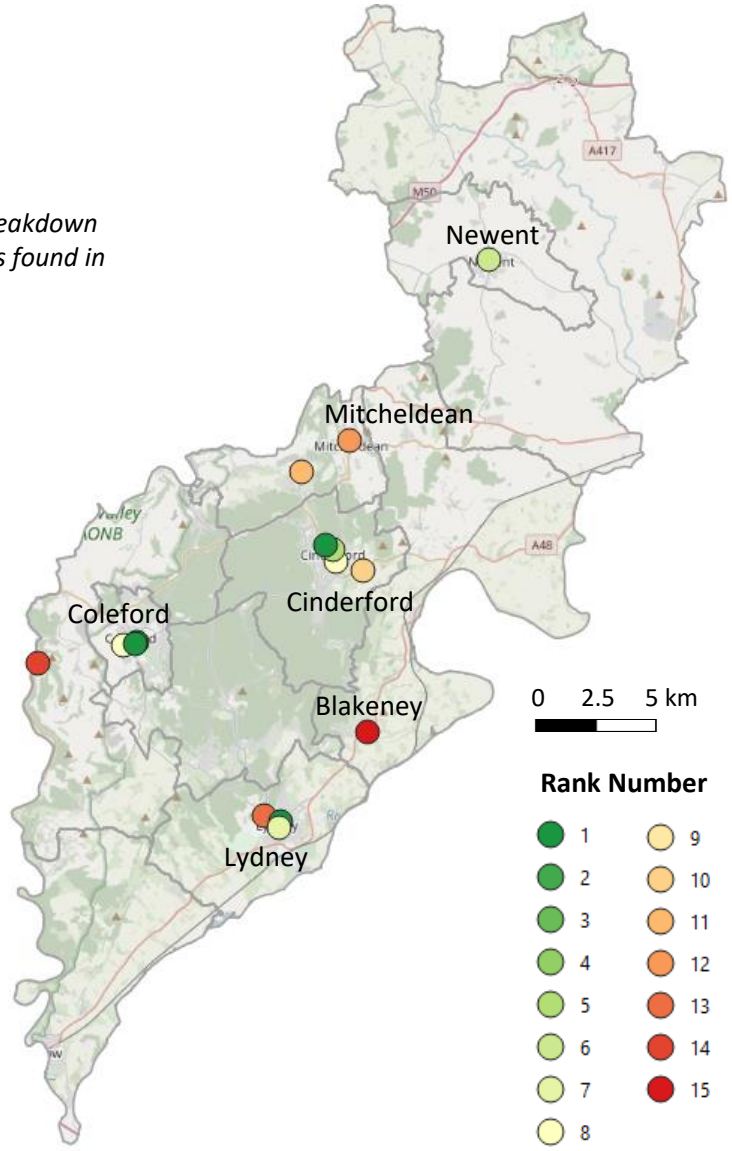
In the car park size and usage scenario the towns of Lydney, Coleford and Cinderford all score highly

Car Park Overall Score and Ranking

- Based on the assessment process, an overall score has been derived for each car park and colour coded on the map and in the table.

Town	Car park	Overall Score	Rank
Lydney	Newerne Street	2.1	1
Coleford	Lord's Hill	2.1	1
Coleford	Railway Drive	2.1	1
Cinderford	Rowandean	2.1	1
Cinderford	Heywood Road	2.05	5
Newent	Lewell Street	1.95	6
Lydney	Swan Road	1.9	7
Cinderford	Belle Vue Road	1.85	8
Coleford	Newland Street	1.85	8
Littledean	Grange Lane	1.75	10
Drybrook	High Street	1.6	11
Mitcheldean	High Street	1.55	12
Lydney	Bream Road	1.5	13
Redbrook	Riverside	1.35	14
Blakeney	Butlers Mead	1.15	15

Note: detailed breakdown of metric scores is found in the Appendix



- The car park size and usage scenario ranks Newerne Street car park highest followed by car parks in Coleford and Cinderford.
- Car parks in Redbrook and Blakeney rank lowest.

The top 50% of car parks are the same for all three scenarios, indicating that they are indeed the most attractive for EVCP deployment

Car Park Scenario Ranking Comparison

- For all 3 scenarios, the car parks ranking in the top half and bottom half are the same
- In general the towns of Cinderford, Coleford and Lydney rank in the top half of the table, showing these to be the most promising EVCP opportunities.
- Rowandean ranks highest in all scenarios – this is the most attractive potential EVCP site based on the assessment process used
- Towns in the lower half of the table are generally smaller and appear more rural. Riverside (Redbrook) and Butlers mead (Blakeney) have the lowest ranks of 14 and 15 for all scenarios.
- Swan Road (Lydney) shows the largest range of ranks from 3 in the baseline scenario to 7 in the car park size and usage scenario.

Town	Car park	Rank by Scenario		
		Baseline	Traffic	Car park size and usage
Cinderford	Rowandean	1	1	1
Lydney	Newerne Street	2	4	1
Cinderford	Heywood Road	3	2	5
Lydney	Swan Road	3	5	7
Coleford	Lord's Hill	5	6	1
Coleford	Railway Drive	5	6	1
Cinderford	Belle Vue Road	5	3	8
Newent	Lewell Street	8	8	6
Littledean	Grange Lane	9	9	10
Coleford	Newland Street	10	10	8
Mitcheldean	High Street	11	11	12
Drybrook	High Street	12	13	11
Lydney	Bream Road	13	12	13
Redbrook	Riverside	14	14	14
Blakeney	Butlers Mead	15	15	15

Note: it is important to remember this is a desk-based analysis and the results are not final assessments. Further investigation will be needed, and on-site assessments also need to be taken into account, as expressed in the later deployment approach section.

Rowandean (Cinderford), Newerne Street (Lydney), Lord's Hill and Railway Drive (Coleford) are the top-ranking car parks in their respective towns

Assessment of Car Parks by Town

- The table opposite compares the car park site assessment scores for each town. Higher scoring sites in a particular town should be prioritised for further investigation into EVCP deployment
- Note that car parks have been grouped by clusters, so some are in a similar area but technically different towns.
- For the Cinderford, Lydney and Coleford clusters the car parks rank in the same order for all 3 scenarios.
- Rowandean (Cinderford), Newerne Street (Lydney), Lord's Hill and Railway Drive (Coleford) and Lewell Street (Newent) are the top-ranking car parks in each town cluster.
- Newent has been separated as a major town but has only one assessed car park with a moderate score.
- Note that Lord's Hill and Railway Drive (Coleford) have the same ranking for every scenario.
- The car parks in other towns are not geographically close so scores should be considered individually. However, all are low scoring, they should not be initially considered for EVCP deployment.

Town	Car park	Rank by Scenario		
		Baseline	Traffic	Car park size and usage
Cinderford				
Cinderford	Rowandean	1	1	1
Cinderford	Heywood Road	3	2	5
Cinderford	Belle Vue Road	5	3	8
Littledean	Grange Lane	9	9	10
Lydney				
Lydney	Newerne Street	2	4	1
Lydney	Swan Road	3	5	7
Lydney	Bream Road	13	12	13
Coleford				
Coleford	Lord's Hill	5	6	1
Coleford	Railway Drive	5	6	1
Coleford	Newland Street	10	10	8
Newent				
Newent	Lewell Street	8	8	6
Other settlements				
Mitcheldean	High Street	11	11	12
Drybrook	High Street	12	13	11
Redbrook	Riverside	14	14	14
Blakeney	Butlers Mead	15	15	15

Assessment of EV charger business cases

Comparison of EV charging business models

Council EV charging deployment strategies

FoD car park site assessments

FoD deployment approach

Car club adoption discussion

Appendix

The overall strategy has been split into 4 phases - 1 planning phase and 3 deployment phases

Phase 0: Planning	• Council needs to agree on deployment strategy and preferred / acceptable models through engagement with selected members • Liaise with DNO and assess grid capacity available at the car parks and connection options • Engage with suppliers, complete site visits, assess deployment / business models, and decide on preferred approach – consider grant funding opportunities (e.g. OLEV schemes) • Bring together relevant people / departments internally required to facilitate deployment • Run relevant procurement exercise based on agreed sites, EVCPs, business model etc.
Phase 1: Priority deployments	• Begin EVCP deployment in most promising towns (Cinderford, Lydney, Coleford), focusing on largest car parks. Both EE car park analysis and further site investigations by FoD should inform final car park locations and number of EVCPs installed. • Assess site specific costs for car parks in these towns such as grid connection and installation. Evaluate grid connection upgrade costs to deploy both fast and rapid EVCPs. Use these costs to identify high cost or no-go sites to adapt deployment plan.
Phase 2: Expand deployment	• Begin deployment in medium scoring car parks in towns where EVCPs have not yet been deployed. • Expand deployment in the most promising towns (Cinderford, Lydney, Coleford) to next biggest car parks. • Use site specific costing assessments to adapt deployment plan. Both EE car park analysis and further site investigations by FoD should inform final car park locations and number of EVCPs installed.
Phase 3: FoD-wide network	• Assess growth of demand and utilisation of previously installed EVCPs in FoD to inform decision of when phase 3 should be carried out, how it should be carried out and at what pace • Deploy EVCPs in lower scoring car parks in towns where EVCPs have not yet deployed, based on growth of demand. • Expand deployment in remaining car parks in/near most promising towns based on growth of demand.

Note: Indicative deployment volumes provided for Phase 1 & 2. Recommendation is for Phase 3 requirement to be assessed as EV uptake develops and the EV charging market in FoD matures.

Deployment strategy roadmap

General rules for type and number of EVCPs :

1. Charging to take up no more than 10% bays, max. of 5 devices
2. Rapid & fast at high scoring sites, fast in others
3. If only 1 charger, fast is deployed so all EVs can use it

2021 H2 | 2022 | 2023 | 2024 | 2025 | Beyond 2025

	Phase 1	Phase 2	Phase 3
Planning and analysis	**After completion of planning Phase 0 in 2021** • Assess site specific costs for car parks in these towns such as grid connection and installation. Evaluate grid connection upgrade costs to deploy both fast and rapid EVCPs. Use these costs to identify high cost or no-go sites to adapt deployment plan.		• Before starting phase 3 deployment, market needs to be assessed in terms of private sector activity, Gloucestershire ULEV strategy progress etc. • Also need to assess growth of demand and utilisation of Phase 1 and 2 EVCPs • Then decide whether further Council-led deployment is in fact needed and if so where
Deployment in most promising towns	*Deploy in **biggest** high scoring car parks in the most promising towns:* **Cinderford – Haywood road (64 spaces)** 2 rapid (2 bays), 2 fast (4 bays) **Lydney – Newerne Street (221 spaces)** 2 rapid (2 bays), 3 fast (6 bays) **Coleford - Railway Drive (201 spaces)** 2 rapid (2 bays), 3 fast (6 bays)	*Expand deployment in most promising towns to next biggest car parks:* **Cindeford – Rowandean (15 spaces)** 1 fast (2 bays) **Lydney – Bream Road (63 spaces)** 2 rapid (2 bays), 2 fast (4 bays) **Coleford – Lord's Hill (55 spaces)** 1 rapid (1 bay), 2 fast (4 bays)	*Expand deployment to remaining car parks in / near most promising towns based on growth of demand:* **Cindeford – Belle Vue road (12 spaces)** **Lydney – Swan Road (20 spaces)** **Coleford – Newland Street (21 spaces)** **Littledean – Grange Lane (15 spaces)**
Deployment in other towns		*Start deployment in medium scoring car parks in towns not yet covered:* **Newent – Lewell Street (109 spaces)** 5 fast (10 bays) **Mitcheldean – High street (40 spaces)** 2 fast (4 bays)	*Deploy EVCPs in the lower scoring car parks based on growth of demand:* **Redbrook – Riverside (50 spaces)** **Blakeney – Butler's Mead (18 spaces)** **Drybrook – High Street (21 spaces)**

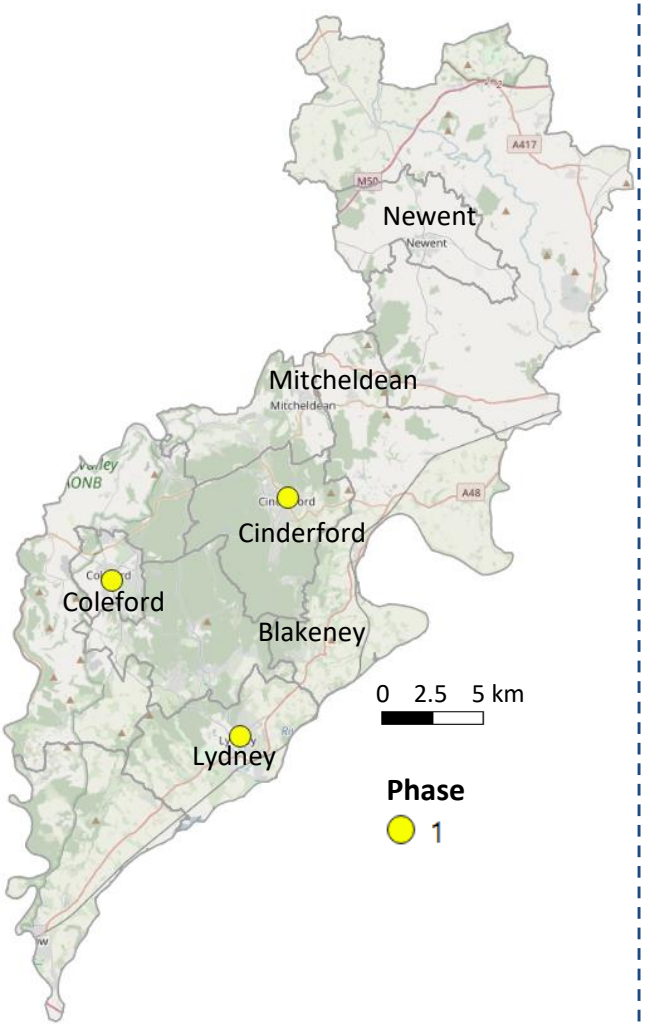
Note: This roadmap acts as a guide and is subject to change as the market and demand develop. EV charger volumes which are only indicative and should be treated as such. The key aspect of the strategy shown is the phased approach, focusing on the most promising car park opportunities first.

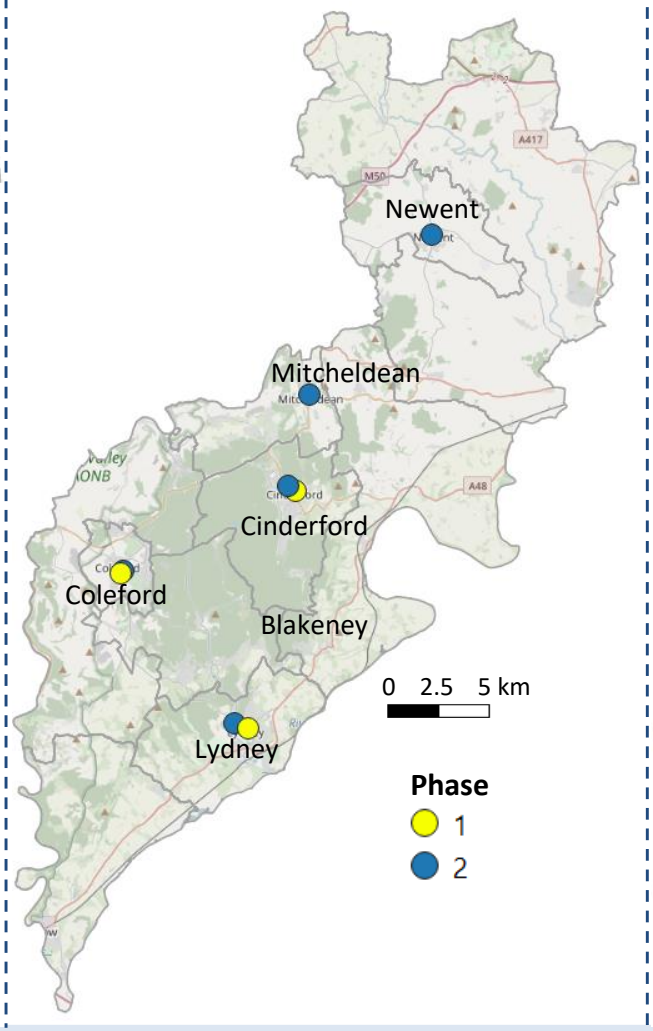
Note: Fast chargers have 2 connectors and bays, rapid chargers have 1 connector and bay. 5 devices per can park based on best practice seen in other UK areas.

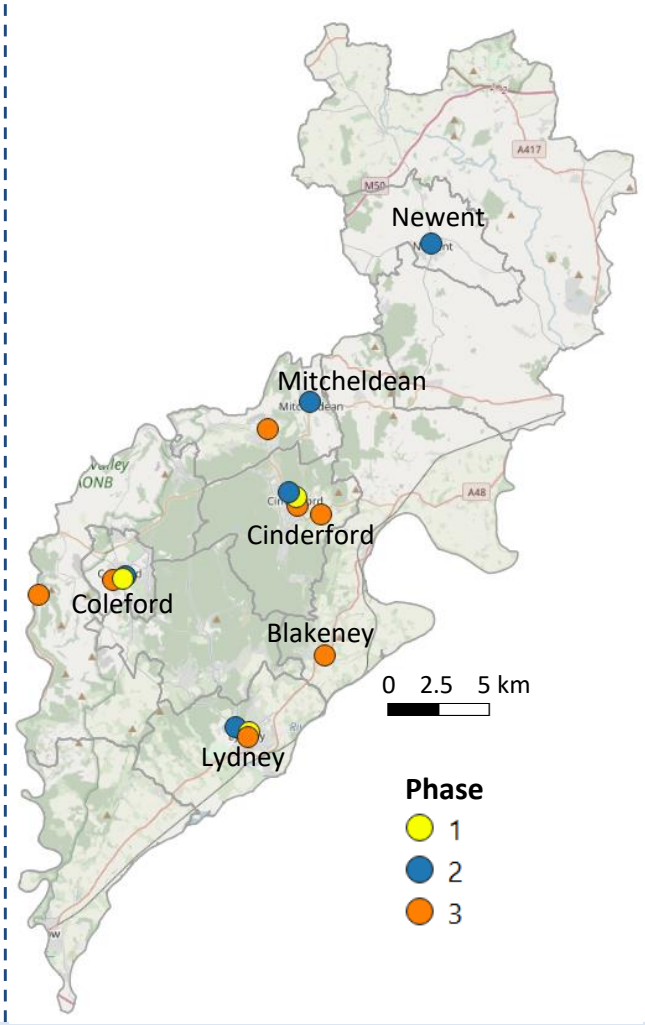
Summary of phased deployment proposed in Forest of Dean

2021 H2 | 2022 | 2023 | 2024 | 2025 | Beyond 2025

Phase 1 | Phase 2 | Phase 3







Note: This roadmap acts as a guide and is subject to change as the market develops. The key aspect of the strategy is the phased approach, focusing on the most promising car park opportunities first.

The following slides show an indicative CAPEX and revenue assessment for Phase 1 & 2, first here is a reminder of some potentially attractive business models

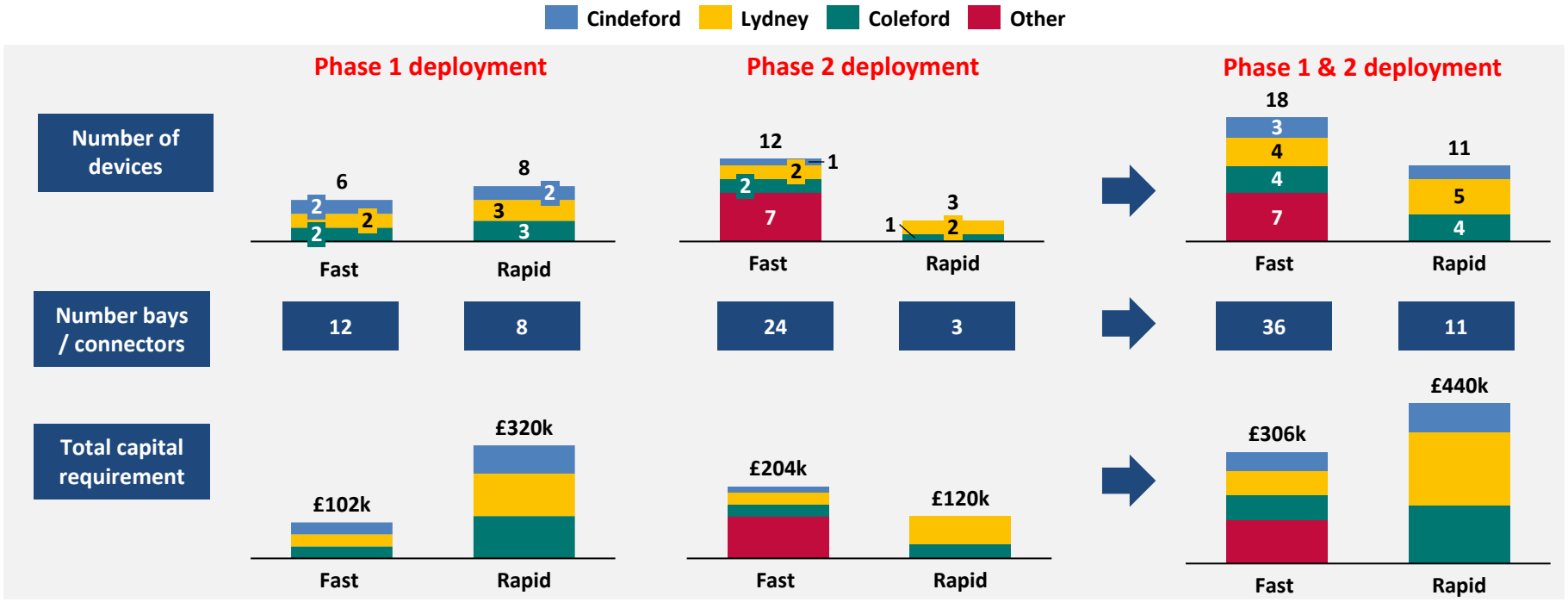
	Private sector match funding	Lease
Overall assessment	De-risked approach that could deliver a range of charging speeds and may offer groundworks ownership. This is a promising option for FoD if grant funding available	Fully de-risked option which is quick and simple to set up. If FoD can agree to the lease lengths required and supplier willing to install at desired car parks - would be attractive option
Capex split	Typically 75% capital funding covered by government grants. 25% either payed by a combination of private sector and council, or all paid by private sector	Depending on agreement anything up to 100% paid for by supplier
Revenue	Approach varies but Council can receive revenue share	Typically revenue share or minimum payment per site

- The table above provides a reminder of two business models shown to be potentially attractive / suitable for FoD, based on the assessment of different models shown earlier in the report
- The capital requirements shown on the following slide are based on **total CAPEX,** but when considering these it is important to consider the business models above to assess what the final cost to the Council might be

Refer to sections 1 and 2 of the report for more detail on business models

The indicative CAPEX requirement for Phase 1 and 2 would be ca. £422k and £324k respectively, but the Council is not expected to fund this

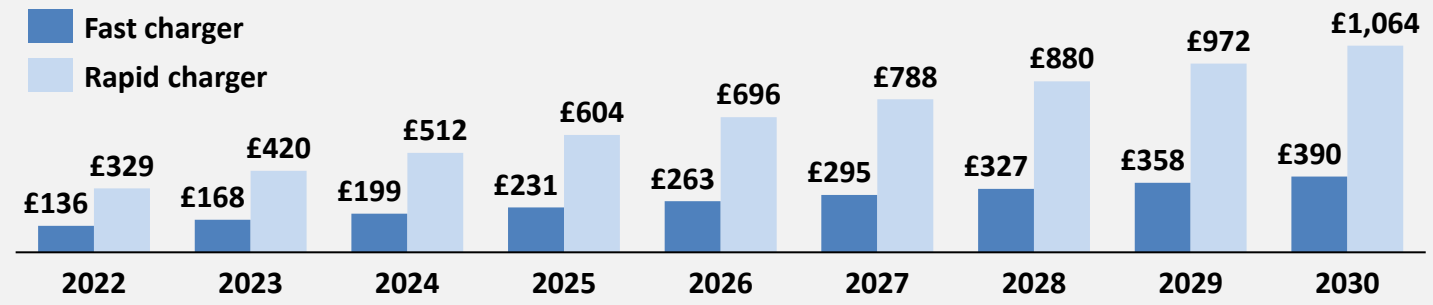
- The analysis below shows the **total CAPEX investment** needed in each phase based on the indicative deployment volumes shown previously
- The **total investment** required is ca. £422k and £324k in Phase 1 and 2 respectively
- However, the **cost to the Council** will **depend on the business model** used (see previous slide)
- Using a match funding business model, a **maximum of 25% of the total CAPEX would be paid by the council**. This relates to ca. £106k in Phase 1 ad £81k in Phase 2. The **remaining 75% would be covered by grant funding** - £317k in Phase 1 and £243k in Phase 2
- In reality, the private sector may provide the match funding, so the capital cost to the Council is zero (all covered by grants + supplier)
- If a lease model was used, **up to 100% of the CAPEX cost could be covered by the private sector** meaning 0% is paid by the council. If the Council wishes to retain ownership of certain aspects (e.g. grid connection) this could be negotiated. This model would require a long lease.



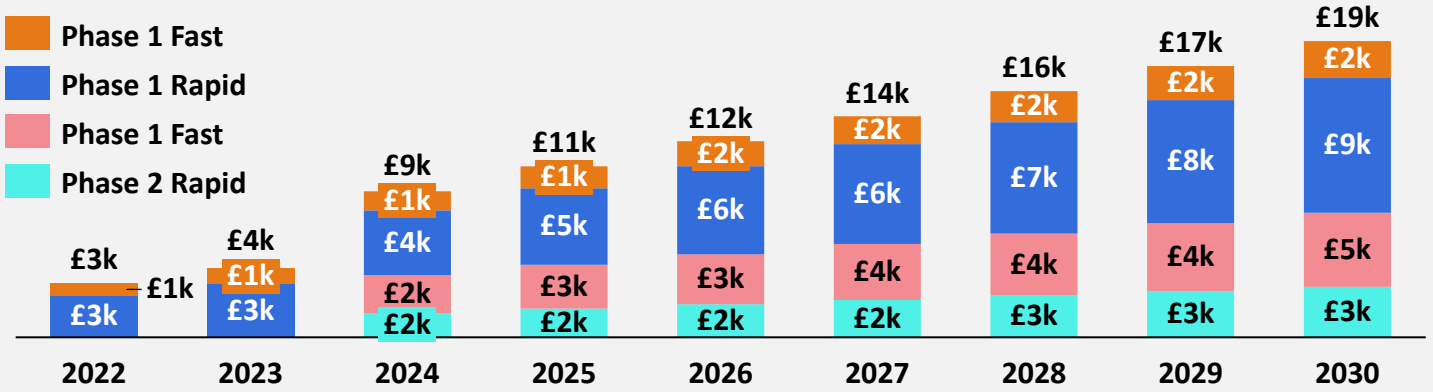
Note: CAPEX estimate includes unit cost, civils / installation (likely to be upper bound values), indicative grid connection costs. Rapid costs based on 50kW chargers. See cost breakdown in appendix.

EVCP business case analysis shows that in the rural utilisation scenario, a 5% revenue share would equate to ca. £1k per rapid device by 2030

The revenue share analysis below is calculated is **based on the 'Lease' business model**, assuming the **Council pays only a small % or none of the CAPEX costs** on the previous slide, as these are covered by the private sector. This option would require a long lease (15-25 years). The revenue share is based on the rural utilisation scenario, and PAYG tariffs of 27p/kWh and 30p/kWh for fast and rapid charging respectively, in line with current market rates.



Estimate of annual Council revenue per charger, based on rural utilisation scenario and 5% share



Indicative annual Council revenue based on revenue per charger above and proposed Phase 1 & 2 deployment

- Based on the indicative deployment outlined on the previous slides, the Council revenue share is shown to reach ca. £20k by 2030
- The analysis above assumes that all Phase 1 chargers are installed in 2022 and Phase 2 in 2024
- It is important to consider the uncertainty in future deployment volumes when viewing the Phase 1 & 2 revenue shares

Assessment of EV charger business cases

Comparison of EV charging business models

Council EV charging deployment strategies

FoD car park site assessments

FoD deployment approach

Car club adoption discussion

Appendix

Overview of barriers to *shared vehicles*

Themes	Common barriers to shared vehicle adoption
Parking infrastructure	• Lengthy and complicated process in delivering new car club bays, due to differences in policy between local authorities • Insufficient access to designated parking bays
Consumer engagement	• Consumers have a low awareness of availability of nearby car clubs • Consumers reluctant to give up ownership of personal cars: – Consumers tend to consider rare journeys rather than regular transport needs – Consumers lack understanding of the true cost of private car ownership – Consumers fear lack of availability, particularly in areas with poor transport links
Operations	• Difficulty reaching profitability, particularly in areas with low population density • Scale necessary for consumer engagement and high utilisation • Competition with other forms of transport e.g. taxis • Car clubs are not integrated well with public transport • Car club fleet target for vandalism

Source: EE review of literature

Overview of barriers to *shared BEVs*

Themes	Common barriers to shared BEV adoption
Charging infrastructure	• Lack of available charge points during journey, so range not guaranteed • Lack of available charge points at return of vehicle, so consumer cannot plug-in vehicle for next user • Lack of interoperability of charge points limits or complicates charging for user • Retrofitting existing car club bays with charge points classified as state aid
Consumer engagement	• Lack of knowledge about electric vehicle and charge point use • Range anxiety • Charging during journey viewed as inconvenient
Operations	• Higher purchase cost of BEVs • Lower utilisation as a result of charging time requirements, reducing profitability • Additional operational cost and labour if car club charges vehicles overnight • Incentivising users to plug vehicle in represents an opportunity cost • Passing electricity costs onto user challenging, as the costs of doing so are currently disproportionate to value of the electricity consumed

Source: EE review of literature

Assessment of EV charger business cases

Comparison of EV charging business models

Council EV charging deployment strategies

FoD car park site assessments

FoD deployment approach

Car club adoption discussion

Appendix

SWOT analysis (1/3)

Own & Operate

Strengths
- Retain ownership of the assets
- Retain revenue from charging
- Council has full control over siting the EVCPs
- Can enable a quick deployment of EVCPs
- Simpler contractual process
- Can deploy range of technologies

Weaknesses
- Council must cover all CAPEX costs – limited government grants available
- Council is responsible for and must fund the ongoing O&M costs
- Resource intensive option requiring in-house expertise
- Council takes on all risk liabilities
- Challenging business case for Council if usage low – revenue may not cover O&M

Opportunities
- Easier to provide charging for all residents – not constrained by commercial viability
- Can provide cheaper charging to residents, if funding for operational costs available
- If run well, can be a boost to Council reputation

Threats
- EVCP market develops quickly and tech becomes outdated
- EV uptake grows quickly so private sector move in and Council EVCPs under utilised
- Unexpected costs such as replacing broken equipment
- Utilisation remains low – bad return on public money

External Operator

Strengths
- Retain ownership of assets
- Retain revenue from charging
- Council has control over siting
- 3rd party contractor takes full responsibility for O&M – reducing low utilisation risk for Council
- Can enable quick deployment of EVCPs
- Less work for council on an ongoing basis
- Can deploy range of tech

Weaknesses
- Council must cover all CAPEX costs
- Challenging to deploy in large numbers
- Council still has the risk liabilities associated with owning the assets
- Political risk is low utilisation leads to poor return on public investment

Opportunities
- Easier to provide charging for all residents
- Can provide cheaper charging to residents
- If run well, can be a boost to Council reputation
- EVCPs can become part of a wider network

Threats
- EVCP market develops quickly and tech becomes outdated
- EV uptake grows quickly so private sector move in and Council EVCPs under utilised
- Unexpected costs such as replacing broken equipment
- Utilisation remains low – bad use of public money

SWOT analysis (2/3)

Private sector match funding

Strengths
- Some CAPEX transferred to private sector
- Risk liabilities can be transferred to private sector
- Supplier has responsibility for O&M work and costs
- Impact of low utilisation reduced
- Can install a range of technologies (depending on grants available)

Weaknesses
- Limited public funding available
- Council may have less control over where EVCPs are sited
- Reduced revenue for the Council
- Less control over pricing
- More contractually complex

Opportunities
- If ownership of underground equipment retained – good basis for upgrading network in future
- If local market develops, supplier may be keen to expand network through a larger contract

Threats
- Technology may become outdated without upgrades being included in contractual agreement
- Government may reduce public funding available

Concession contract

Strengths
- Some CAPEX transferred to private sector
- Risk liabilities can be transferred to private sector
- Supplier has responsibility for O&M work and costs, reducing risk for Council
- Can often retain ownership of underground equipment
- Receive a revenue share
- Impact of low utilisation reduced

Weaknesses
- Council may have less control over where EVCPs are sited
- Less control over pricing
- Often involves long contract negotiations
- Reduced revenue vs some other ownership models
- Suppliers may be unwilling to enter contract in less profitable places
- May require longer term contract to attract supplier
- Likely to only work for 22kW+

Opportunities
- Increasing competition in charging market means more CPOs may be willing to offer / enter these contracts
- Contracts can engage supplier as Council's official "EVCP Partner" - if local EV market growth is strong, supplier will expand network
- Supplier may agree to invest in PR and comms

Threats
- Future car park closure plans require lease to be broken at cost to Council
- Trend of improving charging capabilities slows meaning less EVs than expected can use rapid chargers

SWOT analysis (3/3)

Lease agreement

Strengths
- All CAPEX transferred to private sector
- All risk liabilities transferred to private sector
- Supplier has responsibility for O&M work and costs
- Low utilisation risk removed
- Minimal effort for Council

Weaknesses
- Supplier would require long term lease
- Supplier decides which sites they are willing to deploy at
- Supplier sets pricing
- Typically only offers rapid charging (not useful for all EVs)

Opportunities
- Strong EV uptake may result in supplier being willing to install at the less attractive sites
- Increased competition leads to more attractive lease deals
- Growing EV uptake may lead to shorter lease requirements
- Continued EV improvements means more drivers can rapid charge

Threats
- Future car park closure plans require lease to be broken at cost to Council
- Trend of improving charging capabilities slows meaning less EVs than expected can use the infrastructure (at speed intended)

We have identified a procurement framework that has been used by a range of Councils and could be relevant to FoD

ESPO Framework 636

- National framework offering public sector organisations a range of charging solutions
- Includes slow, fast and rapid EVCPs, back office solutions, and “emerging technologies”
- Purchase and lease options are both offered
- Suppliers include BMM, Chargemaster, E.ON Energy Solutions, POD Point Ltd, Siemens, New Motion etc.
- Framework runs until end-June 2021 (already been extended once)
- The framework has been used by many Councils to deploy EVCPs including:
  - Southampton City Council deployed 30x 22kW EVCPs across 5 public car parks
  - Coventry City Council deployed 8 rapid EVCPs using £702k OLEV funding with Siemens match funding 25% and offering revenue share (15-year contract)
  - Rotherham metropolitan borough council deployed EVCPs, solar PV and battery storage at a public multi storey car park
  - Ipswich, Moray, Cambridge, Hull, Argyll, Leicestershire and Bristol have also used this framework

Detailed breakdown of site assessment scores for the 15 car parks

Car Park Name	Car Park Spaces	EV Uptake in MSOA	Trips in MSOA	Traffic Flow	Distance to major road	% Off-street parking	Amenities	Car Park Utilisation
Rowandean, Cinderford	1	2	3	3	3	2	1	3
Belle Vue Road, Cinderford	1	2	3	3	3	2	1	2
Heywood Road, Cinderford	2	2	3	3	2	2	1	2
Newerne Street, Lydney	3	3	2	1	2	2	3	1
Swan Road, Lydney	1	3	2	1	3	2	3	2
Grange Lane, Littledean	1	2	3	2	2	2	2	2
Lord's Hill, Coleford	2	1	2	2	1	1	2	3
Railway Drive, Coleford	3	1	2	2	1	1	2	2
Lewell Street, Newent	3	1	1	3	1	3	2	1
Newland Street, Coleford	1	1	2	2	1	1	2	3
High Street, Mitcheldean	2	1	1	2	2	1	2	1
High Street, Drybrook	1	1	1	3	1	1	1	3
Bream Road, Lydney	2	3	2	1	1	2	1	1
Butlers Mead, Blakeney	1	3	1	2	2	1	1	1
Riverside, Redbrook	2	2	1	1	2	1	1	1

Note: Not in rank order as this varies based on weighting scenario