Report
March 2026

On-Street Charging - Emerging Solutions

Transport for the South East
24559706

steer

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Executive Summary

Overview

As EV adoption increases and the off-street charge point rollout continues at pace, households without off-street parking face persistent barriers to affordable charging reinforcing a “charging divide” between driveway and non-driveway households.

In response to this growing challenge, Transport for the South East (TfSE) commissioned this study to strengthen the evidence base and provide a practical toolkit to help Local Transport Authorities (LTAs) plan, prioritise, and deliver equitable, efficient, and future-proof public charging infrastructure for households and businesses without off-street parking. The report is structured in two parts.

- **Part 1** establishes the current on-street and cross-pavement charging landscape across the TfSE area, including what is being deployed, under which delivery models, and with what operational, social, and spatial implications.
- **Part 2** examines emerging and complementary solutions that are being deployed to reduce pressure on the kerbside space, including digital TRO-enabled dynamic kerbside management, shared domestic charging and shared depot charging, alongside other partnership-led approaches.

What this study has done

The work builds on TfSE’s May 2025 EV Programme Discovery Project and translates the discovery themes into tools and insights designed to support the delivery of on-street charging infrastructure.

It combines quantitative analysis of EV uptake and charging provision with the findings from an LTA survey and follow-up interviews designed to capture the requisite delivery conditions, including procurement and governance arrangements, policy status on cross-pavement charging, enforcement approaches, and how provision is (or is not) being tailored to different user segments.

This is complemented by targeted stakeholder engagement with six charge point operators offering a range of hardware solutions, two accessibility organisations, a digital TRO and kerbside management provider, and fleet and payments platforms, ensuring that conclusions reflect both local authority realities and market delivery constraints.

Alongside this baseline, the report develops an on-street charging typology and associated decision-making framework, linking hardware types and installation layouts to the environments in which they are most likely to be effective. A strategic taxonomy is also introduced to describe how authorities are approaching rollout in practice, recognising how delivery approaches are shaped by ambition, political context, kerbside pressure, asset ownership, and organisational capacity.

Summary findings

Delivery performance is primarily constrained by governance and kerbside management rather than charger technology. Across the TfSE area, rollout is shaped by funding sequencing, internal capacity, TRO processes, enforcement capability, grid connections and maintenance demands, with kerbside competition and parking sensitivity consistently influencing what is politically and operationally feasible.

Delivery approaches that respond to these issues are maturing, although progress remains uneven. Many authorities are scaling up lower-power residential provision such as lamppost chargers, while others avoid certain solutions due to streetscape, accessibility, or long-term ownership and maintenance considerations.

The selection of charging hardware is also informed by several other factors including user types and charging use cases, street heritage/aesthetic considerations, and accessibility needs.

Environment	User type			
	LCV	Disabled user	Car	Taxi/PHV
On-street urban centre	**Ultra-fast charging** + *minimal kerb impact* + *high utilisation*	**Guaranteed accessibility** + **reliability** + **clear, protected space**	**Convenience** + *turnover* + *kerbside efficiency*	**Ultra-fast charging** + **predictability** + **queue avoidance**
On-street urban residential	**Predictable access** + **longer dwell** + *residential compatibility*	**Guaranteed accessibility** + **certainty of access** + *wider residential compatibility*	**Long-dwell compatibility** + **cost effectiveness** + *equitable access* + *scalable deployment*	**Predictable access** + *controlled residential impact*
On-street suburban residential	**High reliability** + **overnight energy sufficiency** + *low-density compatibility*	**Guaranteed accessibility** + **maximum reliability** + **proximity to home**	**Reliable coverage** + **cost effectiveness**	**High reliability** + **overnight energy sufficiency** + *cost-proportionate provision*

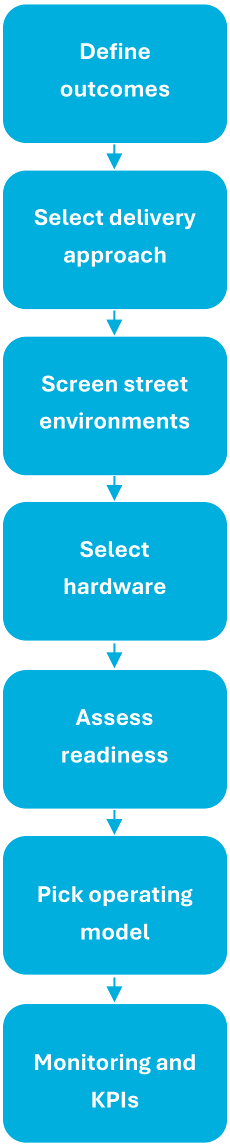
Accessibility for those with mobility impairments is also not resolved through compliance alone. Usability depends on siting, bay geometry, cable handling, and reliability, with predictable access especially important for disabled motorists.

In practice, no single approach will meet all strategic ambitions for on-street charging. The emerging solutions explored in the second part of this report can help to relieve pressure on the kerb, but only where enabling conditions are in place.

Dynamic kerbside management is cited as a solution which can improve reliability and utilisation where TRO data is digitised and enforcement is integrated, particularly in mixed-use and commercially pressured areas. Other emerging solutions such as shared domestic and shared depot charging can reduce pressure on the kerb, but scale is constrained by liability clarity, operational culture, security, billing, and data-sharing complexity.

Next steps and how the toolkit is intended to be used

The toolkit is intended to be used as a structured decision pathway that helps LTAs translate strategic intent into deliverable, defensible choices on the ground.



It begins by defining which outcomes are being prioritised in the next phase of rollout (typically balancing equity, pace, acceptability, utilisation, and public realm/accessibility considerations). Making these trade-offs explicit reduces policy drift and strengthens the basis for consultation and site selection.

The taxonomy of authority approaches then supports selection of an appropriate delivery approach by place type, recognising that different contexts require different levels of kerbside control and different levels of delivery ambition. Alongside this, the charger typology framework supports matching infrastructure to the combined needs of user groups and street environments, so that decisions on power level and hardware type are grounded in how streets and users behave in practice, not simply what is easiest to install.

A key element of the appropriate route to delivery is readiness: before selecting interventions that depend on compliance (such as designated bays), the toolkit directs authorities to assess TRO maturity, kerbside data quality, and enforcement capacity, and to choose approaches that can be delivered credibly within those constraints while setting out enabling steps to progress over time.

In practical terms, the next steps for LTAs are to apply the toolkit to refine near-term rollout pipelines by place type, identify targeted pilots where DKM or shared charging can address acute constraints, and strengthen accessibility expectations within procurement and operational monitoring.

For TfSE, the next steps centre on facilitating shared learning and harmonisation across authorities, supporting more consistent approaches to digital TRO maturity and kerbside data quality, and prioritising where regional support and further piloting will have the greatest impact.

1 Introduction

1.1 Background

As EV adoption increases and the off-street charge point rollout continues at pace, households without off-street parking face persistent barriers to affordable charging reinforcing a "charging divide" between driveway and non-driveway households.

In response to this growing challenge, Transport for the South East (TfSE) has commissioned this study to build an evidence base and a practical set of tools to help local transport authorities (LTAs) plan, prioritise, and deliver equitable, efficient, and futureproof public charging infrastructure for households and businesses without off-street parking.

This report is structured in two sections:

- **Part one** develops a baseline picture of current on-street and cross pavement charging: what is being deployed, where, under which ownership and delivery models, and with what operational, social, and spatial implications.
- **Part two** examines emerging and complementary solutions that can reduce pressure on the kerb such as shared domestic charging, shared depot/workplace access, and commercial hub models.

This study builds on previous discovery work (summarised below) to provide an evidence-led approach to delivering the future of on-street electric vehicle (EV) charging. The approach combines literature and data reviews with LTA surveys and interviews, targeted stakeholder engagement (including accessibility groups, charge point operators (CPOs), Distribution Network Operators (DNOs) and enforcement teams), and representative case studies. This ensures that recommendations are credible, scalable, and sensitive to local context, while remaining grounded in the practical realities faced by local authorities.

1.2 Summary of previous work (EV Discovery Project)

In May 2025, TfSE and Steer completed the EV Programme Discovery Project to establish a regional baseline and codesign the next phase of support with LTAs. The work combined quantitative analysis of EV adoption and EV charging infrastructure (EVCI) rollout with structured interviews across TfSE's constituent LTAs, exploring what has worked well and what is holding programmes back.

The Discovery Project identified seven themes:

1. **Maturing public sector delivery practice:** Local authorities are moving from ad-hoc pilots to more standardised, end-to-end delivery approaches, but many are still constrained by changing guidance, approval requirements, and coordination challenges.

2. **Securing and sequencing public funding:** Public funding (particularly Local Electric Vehicle Infrastructure (LEVI) funding) is essential, but can be slow to access and hard to align with local governance and procurement timelines, which can stall schemes that are otherwise ready to deploy.
3. **Enabling private investment consistent with procurement rules:** Authorities are seeking to structure propositions that remain compliant with procurement and grant terms while still offering CPOs routes to return on investment and protections against early termination risk.
4. **Equity across socio demographics and geographies:** Charging rollout needs to address uneven access to charging at home, differing affordability constraints, and practical delivery barriers in high-density and lower-affluence areas, so benefits are not concentrated in already-advantaged places.
5. **Electrification of commercial vehicles:** Van and fleet electrification lags that of cars and is held back by confidence and charging availability, requiring more proactive demand assessments and engagement with operators to unlock viable depot and en-route solutions.
6. **Electrification of authority fleets:** Councils need coordinated plans across property, fleet, HR, and finance to convert vehicles and depots (including energy procurement and site reconfiguration), rather than treating fleet as a separate workstream.
7. **Capacity, skills and resourcing:** Delivery is repeatedly limited by internal capacity (e.g., procurement, legal, GIS, project management) and external dependencies (CPOs, DNOs, maintenance), making capability funding and shared support models particularly important.

The Discovery Project set out recommendations for TfSE’s role as a regional facilitator, which provide the direction that this study now contributes to, translating shared challenges into a pipeline of evidence-led tools, frameworks, and playbooks that LTAs can adopt and refine.

2 Current charging landscape

2.1 Current challenges

Background

Evidence from TfSE's 2025 EV Programme Discovery Project highlights a set of barriers that shape the pace and quality of rollout across the South East:

- LEVI funding cycles and approval processes, late or changing guidance, and election related timing effects have introduced uncertainty and delay.
- Authorities report resource constraints, complex procurements, and market saturation among operators. In this context, maintaining affordability while ensuring commercial viability can be challenging, especially where charging provision is delivered ahead of demand.
- Accessibility of bays, the needs of residents without driveways, and confidence among new users (including commercial drivers) require careful, ongoing engagement.
- DNO connection delays, maintenance backlogs, and the variability of local EV adoption patterns complicate delivery.
- Uncertainties around cross-pavement solutions, liability, and landlord permissions for installations (particularly in leasehold settings) continue to slow progress.

The data from the study highlights these pressures and the diversity of starting points across the region. As of Q2 2024, around 5.5% of cars and vans in the TfSE area were electric (vs 4.6% UK wide), with an average of 28 EVs per public charger (vs 30 nationally). However, the data also indicates significant variation between LTAs when measured by EV/charger ratios and by estimated public network power relative to AFIR style benchmarks.

These differences reflect contrasting levels of off-street parking and uneven availability of workplace charging, both of which influence the quantity and type of public provision required.

The rollout and operation of on-street EV charging is shaped by governance and the day-to-day operational realities of activity at the kerbside. Local authorities must navigate a variety of statutory processes, competing kerbside demands, enforcement considerations, and partnership arrangements, often with limited internal capacity and within constrained spaces.

These challenges are compounded by the need to balance flexibility for users with clarity on enforcement, accessibility, and public acceptability, particularly as charging infrastructure becomes more widely available and more intensively used.

Cross-pavement charging barriers and the emerging 'charging divide'

Recent national survey evidence from EVA England[1] highlights how households without driveways continue to face substantial barriers to accessing affordable domestic charging. Although a large majority of respondents in recent surveys report that a cross-pavement solution could work for their property, very few have been able to install one in practice.

High planning costs, lengthy approval processes, inconsistent council responses, and uncertainty over local policy are repeatedly cited as deterrents. In some cases, the planning process adds several hundred pounds to installation costs, on top of upfront expenditure that can already exceed £3,000, creating a financial hurdle that particularly affects lower income households.

Users also report inconsistent and sometimes contradictory messaging from local authorities. Some councils have expressed concerns about safety risks from engineered cross-pavement systems, while simultaneously tolerating temporary armoured mat arrangements that many respondents perceive as less safe and more obstructive for pedestrians. Where cross-pavement solutions have been installed, user feedback is highly positive: survey respondents cite improved safety, ease of use, and significantly reduced charging costs, particularly when combined with solar generation or off-peak tariffs.

These findings underline the need for clearer national guidance, streamlined local processes, and more consistent policy positions on cross-pavement solutions to ensure that on-street households are not left behind in the transition to electric vehicles.

2.1.1 Local authority perspectives on on-street charging

Local transport authority survey and interviews

To gather additional perspectives and greater insight into the TfSE region specifically, an LTA survey and a series of follow-up interviews were undertaken as part of this study.

The survey was designed to build a consistent picture of what infrastructure is already in place and what is planned, the policy and operational context shaping delivery, and the practical challenges authorities are encountering as the provision of on-street charging infrastructure increases.

It also captured where authorities are testing newer approaches, including cross-pavement solutions and dynamic kerbside management (DKM), and how provision is being tailored to different user groups.

The survey covered four main areas, it:

- **Mapped the current and planned mix of on-street charging hardware** (from lamppost and bollard/post-mounted solutions through to pop-up/flat-and-flush chargers), alongside enabling cross-pavement measures such as armoured mats and cable gullies.
- **Recorded the status of local policies on cross-pavement charging** (e.g., banned, permitted under licence, pilot, or awaiting internal decision), reflecting

[1] https://www.transportxtra.com/publications/local-transport-today/news/80093/drivers-urge-government-to-act-on-charg?etid=7446531&artid=80093

the fact that policy clarity is often a key determinant of delivery pace and user confidence.

- **Identified the most common barriers to rollout, operations, and management** (including planning permission, TROs and parking management, accessibility, enforcement, grid capacity, procurement, contract management, and ongoing costs), and invited authorities to describe the solutions and workarounds they have adopted.
- **Explored the extent of charging offer differentiation by user segment** (for example, residents without driveways, taxis and private hire, light commercial vehicles, public sector fleets, and disabled users), and whether DKM techniques have been used to manage availability, reduce conflict with other kerbside uses, and improve utilisation of existing infrastructure.

The survey was sent out to all local authorities, of which 10 responded. Following the survey, a targeted selection of deep-dive interviews were conducted with four LTAs including both county and unitary councils from across the area to capture the nuances behind the headline findings from the previous data collected. A wide variety of place types were targeted to ensure coverage across urban and rural contexts, high and low EV uptake, and across areas representing a range of political constituencies.

NB: *Due to limited responses from the LTAs across the region, qualitative analysis of the responses across the two research methods has been compiled in the section below, with available data used to validate observations that were consistent with interview findings.*

Current provision and preferred hardware types

Across interviews and survey responses, the strongest delivery approach currently being deployed is to deliver lower-power residential on-street charging. This is often chosen due to the ease of reusing existing highway assets and delivering at scale with relatively repeatable design and approval processes. One local authority described a programme trajectory of c. 7,000 units over six years, with the large majority expected to be lamppost or supplementary post solutions, reflecting both LEVI's residential emphasis and a "use existing assets" logic.

Where councils are segmenting their procurement approach, it tends to be through contracts organised by power band. One authority referenced a three-lot structure: up to 8 kW (lamppost), 8–50 kW, and 50+ kW, with mid/high-power solutions largely expected to be standalone units (lower volume than lamppost, but still at material scale).

By contrast, some authorities are deliberately avoiding lamppost charging, driven by a mix of physical siting constraints (e.g., columns at the rear of footways) and associated accessibility concerns, and long-term liabilities. In one case, the decision not to pursue lampposts was linked to the prevalence of back-of-pavement columns and a desire for socket height/accessibility outcomes that felt more straightforward with other street furniture forms, alongside concerns about ownership and maintenance interfaces over time.

Heritage and streetscape constraints are consistently highlighted as a practical challenge. It was noted that many heritage assets (lampposts) are not suitable for direct EV charge point attachment, and other locations are precluded where columns are distant from the kerb or separated by verges. Some workarounds noted include feeding supplementary posts from such assets where possible.

Cross-pavement solutions

Policy maturity on cross-pavement solutions is mixed and often cautious. Cross-pavement gullies were often described as having “a place” but were frequently positioned as secondary to public charging infrastructure provision. They are seen as more of a fallback option where public provision is not viable (commercially or physically), In many cases, local authorities indicated that policy frameworks for these solutions are still under development, with the expectation that any formal policy adoption would require Cabinet approval.

In many cases, cross-pavement cable management is shaped by risk concerns such as the likelihood of trip hazards and the unpredictability of where vehicles will actually park relative to a gully, with some LAs explicitly wary of the behavioural assumptions required for safe use.

At the same time, other LAs had implemented a more operationally detailed route to approvals via a managed/licensed model: a supplier-supported approach including pre-assessment, photographic plans, and ongoing administration through a resident register, with an indicative resident fee (c. £60/year after two years) covering maintenance/insurance and reducing the LA’s ongoing administrative burden.

It was not uncommon for other LAs to describe being pushed by lobbying from residents and elected members, as well as broader pressure to demonstrate a comprehensive residential charging offer in the context of LEVI funding bids. However, many wanted to avoid committing before understanding risk/standards implications. In this case, many LAs were seeking more formal guidance or route maps to follow to add weight to their policy decisions, and to provide a ready-made formal response that could be used in the event of public or political pushback.

Governance, approvals, and TRO processes

Interviewees repeatedly framed roll-out of EVCI as a process design challenge as much as a technology challenge, particularly where approvals require the involvement of multiple teams (highways, parking, legal, communications, etc). One LA described building an end-to-end pipeline that takes candidate LEVI locations through approvals and consultation, including a dedicated TRO consultation route where responses are reviewed before installations progress.

A recurring governance nuance is the interface between highways authority responsibilities and district/borough roles, especially for parking enforcement and, in some cases, taxi licensing decisions influencing where certain chargers are best located.

Parking controls and enforcement regimes

On-street parking is consistently described by LAs as the most sensitive constraint, and one that shapes both their appetite to introduce TROs and the type of restrictions councils are prepared to apply. In high street contexts, earlier LEP-funded schemes used TROs with time-limited EV-only parking during daytime (often aligning with existing high street controls), while allowing any vehicle to park overnight. This effectively treated restriction as a time-of-day tool rather than a blanket designation.

However, in residential areas, some interviewees described a shift away from routinely applying TROs to newer EVCI deployments, reflecting the transaction cost of TROs versus the desire for pace and scale of delivery.

The political sensitivity around removing or redesignating parking should not be understated. Attempts to introduce dedicated EV bays in one location received very significant opposition which created political challenges, leading to a more incremental approach, of trialling dedicated bays in a subset of locations first to build the utilisation case before expanding. It was noted in discussions that this may be a transitional challenge which subsides as EV adoption accelerates, and as an increasing share of residents view on-street charging as something they might need or benefit from.

In managing this, some LAs highlighted favouring practical design choices that deliberately avoid creating "exclusive" bays around lamppost chargers. This included opting for installing charging with no TROs and no bay markings, with only small signage on the column. Adopting this approach avoids inadvertently reserving multiple adjacent spaces around a single lamppost.

A further enforcement issue is that charging can inadvertently interfere with existing controlled parking systems. One LA described complexities where introducing a TRO linked to a charging asset necessitates the removal of underlying parking controls. One solution was the introduction of app-based fees equivalent to parking charges, however there is still uncertainty about how this sits alongside charge point regulatory expectations.

Integration of systems for monitoring compliance

Authorities are moving (at different speeds) towards integrated digital toolchains that link parking controls, TRO status, consultation feedback, and charging roll-out plans. Some local authorities reported having their whole area mapped in a digital TRO (D-TRO) platform and actively working to bring restrictions data into a charging-focused tool (Chargepoint Navigator) so teams can view constraints in one place when assessing candidate sites.

Others also described parallel consultation channels including one public "pin drop" platform for suggested charger locations, and a TRO consultation site for statutory feedback. Together, the two platforms created an evidence base for both demand mapping and risk/objection management.

Where external administrative models are used, LAs emphasise still needing asset database cross-checks between lamp columns, cable gullies, and other on-street charge points to manage electrical safety/proximity ("sim touch") and future scheme planning.

Capacity constraints and delivery challenges

Resource capacity constraints were common across respondents, but they present differently by authority and their chosen approach:

- **Legal/wayleave style constraints on lighting assets**: One LA described a conservative legal interpretation requiring Section 115-type consent where lamp columns are within the pavement, creating a practical bias towards installing in verges to avoid frontage consent.

- **PFI street lighting contracts**: Another noted PFI arrangements can add change-control friction, but also create efficiencies where the PFI operator can undertake fitment directly (reducing surveys and interfaces).
- **Heritage/conservation considerations**: Multiple LAs flagged the need to screen for heritage/conservation constraints during site selection, also describing practical workarounds for heritage lighting assets.
- **Accessibility and inclusive design**: Balancing charging provision with inclusivity can occasionally be a challenge, as evidenced in a real-world case where a cable gully and charge point served a Motability-supported resident adjacent to an advisory disabled bay. This highlighted that the broader challenge is not only equipment specification, but also the location of the charge points relative to needs linked to accessible movement and use.

Partnership models with CPOs

The interviews show a general shift towards more structured commercial arrangements. These are often concession-like in practice, even where delivery models vary. Section 3.5.3 explores governance and partnership models in more detail. Examples of different types of models discussed in this research include:

Table 2.1 : Comparison of the different models

Model	Capital Risk	Revenue Risk	Control for LA	Common for on-street
Public Ownership	High (public)	High (public)	Very high	Limited
Concession / Revenue-Sharing	Low (private)	Low (private)	Medium	Very common
Anchor-Tenant / Co-investment	Low	Low	Low	Common
Hybrid / Innovation Partnership	Shared	Shared	Medium	Very common
Community / Cooperative	Shared	Shared	Medium	Emerging

Insights by user segment

Residents without off-street parking remain the priority segment for LEVI-driven programmes, with many councils focusing primarily on walk-to-charger coverage and overnight charging suitability. Some local authorities explicitly articulated an ambition to bring a large share of homes without off-street parking within a short walk of charging, framed within a broader decarbonisation strategy.

However, interviews also highlighted several secondary segments that matter in design and messaging:

- **Households with driveways (but still needing public charging sometimes)**: Some LAs described preparing policy logic for why a network approach still benefits households with off-street parking (e.g., those with short-term leases, constrained domestic electrics, visitors).

- **Fleet and commercial use cases**: One council referenced additional Trojan Home[2] style units, including a tranche aimed at commercial vehicles, positioning this as a practical response to fleet needs. One use case example of a local plumber who relied on on-street charging similarly reflects a view that visitors/trades should not be assumed able to use private drive or depot chargers.
- **Taxis**: Another LA described dedicated taxi charging provision across ranks, town centres, and car parks, shaped by coordination with licensing authorities.
- **Disabled users**: The Motability-linked example suggests both latent demand and the potential value of targeted partnership/communications with disability stakeholders. However, it also highlighted that accessibility is as much about siting and kerbside context as it is about charger specification.

Impacts on non-users and the wider kerbside system

Non-user impacts emerge most strongly through parking displacement, perceptions of fairness, and footway incursion risk. Many respondents characterised parking as highly emotive and increasingly safety-critical in some residential contexts. Frequently mentioned were “parking wars” style behaviours and a strong sensitivity to the perceived loss of even a single space. Many LAs report that the political acceptability of dedicating bays can be low in high-pressure areas, even when charging infrastructure (e.g. lamppost chargers) already exists.

Authorities are also pre-emptively trying to avoid future conflict through siting rules. A common approach is to avoid placements directly outside property frontages, partly to reduce negative consultation feedback, and also to avoid constraining potential future Blue Badge provision.

2.1.2 Challenges for commercial vehicle use of public charging

Public charging is increasingly necessary for many commercial fleets (such as delivery vehicles and vans used by tradespeople) as the push for electrification continues, especially for take-home vehicles without access to off-street parking/charging and those without depot charger access. However, it is more expensive, less reliable, and raises security concerns (e.g., vandalism, tool theft, cable theft).

Operational concerns

Charging on street (as opposed to in a depot) was also associated with security concerns. High-value equipment and vehicles are targets for theft and vandalism, especially when parked on-street overnight at home. Interviewees also told us that (council) branded vehicles are targeted even when there are no valuables on board and there is clear signage to indicate this. Common security measures include slam locks and keeping vehicles in depots or at home where possible.

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[2] Trojan Energy entered administration in February 2026, and its business and assets were subsequently acquired in a pre-pack sale by Urban EV Infrastructure Limited, a subsidiary of Connected Kerb Limited.

There are also concerns over operational efficiency. If it is not practicable to charge vehicles at a worker's home, fleet managers engaged as part of this research prefer depot charging in part because vehicles can be charged while not otherwise in use, whereas on-street charging often happens during the working day, disrupting operations.

Public perceptions

In order to fully electrify their fleets, many organisations will need to rely on public charging. Yet, stakeholders noted that there is a common perception from members of the public that commercial drivers should not be using public EV infrastructure as there is an assumption that such vehicles can charge at their depot, sometimes this can result in confrontation.

Drivers of LCVs want to avoid verbal abuse, and companies want to avoid any reputational issues. Campaigns to make it clear that public charging infrastructure is open to all users would help to reduce or remove this psychological and potential reputational barrier.

Other challenges

On-street rapid charging is generally seen as impractical for LCVs due to bay size (e.g. long wheelbase vehicles), congestion, and operational disruption, with loading bays in busy urban areas in near-constant use throughout the day. Most stakeholders do not favour rapid charging in loading bays for these reasons, and they generally aim to minimise the time they spend occupying them.

Ultimately, on-street public charging is largely viewed as a necessary but problematic solution by commercial fleet managers, with particular concerns over cost, security, and operational efficiency. Consequently, commercial fleets are currently reluctant to use public charging except as a last resort, but this is likely to be the only option for many sole traders.

2.2 Accessibility considerations

2.2.1 Context and why this matters

On-street EV charging is regarded as essential by many households without off-street parking, but stakeholder engagement indicates it remains materially harder to deliver in an accessible way than off-street or destination provision. This is largely because on-street infrastructure must be retrofitted into constrained, often already sub-optimal streetscapes where gradients, narrow footways, street furniture, drainage features, parking pressure, and traffic exposure all limit what can be achieved.

Stakeholders also cautioned against treating accessibility as a hardware compliance exercise, as installations may meet individual PAS 1899 requirements (such as reach ranges or socket heights), yet still be unusable because the overall user journey and surrounding space have not been designed holistically.

2.2.2 Streetscape constraints and level access

In on-street contexts, spatial constraints and level access are repeatedly identified as challenges. Many locations struggle to provide level access within tolerances, sufficient manoeuvring space for wheelchair users, and bays that are long and wide enough to accommodate wheelchair accessible vehicles (WAVs).

Passengers are also highlighted as a gap in current accessibility thinking. The disabled person is not always the driver, and passengers' needs are often not considered when designing charging layouts and requirements. Many Blue Badge holders do not drive and may be passengers with a wide range of needs (including visual impairments or neurodiverse conditions), so accessibility should be framed around the whole trip experience, rather than the driver alone.

Engagement with disability charities also highlights how disabled occupants may need rear-entry or side-transfer space (e.g. WAV users), which affects how a vehicle must be positioned relative to the charge point and therefore the bay layout needed for charging to be usable in practice.

Build-outs can help create space and keep cables closer to the kerb, but poorly designed buildouts (for example, those that are stepped, disconnected from dropped kerbs, or difficult to mount from a wheelchair) can create new barriers. This aligns with previous research undertaken by Steer that concerns over "bay dimensions" are among the metrics where on- and off-street accessibility diverges most significantly.

2.2.3 Cable handling, force requirements, and non-user impacts

Cable handling remains one of the most consistent barriers for disabled motorists, particularly where higher-powered units use heavy, stiff cables without assisted cable management. Stakeholders highlighted that the force required to pull, position, and connect rapid charging cables can be prohibitive for some users, especially from a wheelchair and in poor weather. In this sense, the lower-power charge points often installed in on-street contexts may be more accessible to users, but only where the wider bay features can accommodate access.

Cable management issues can also impact non-users. Where cables cross or encroach on the footway, they can become trip hazards for pedestrians, particularly in dense residential streets where cross-pavement solutions are more common.

2.2.4 Reliability, information, and booking as accessibility enablers

Disabled motorists are more likely to plan journeys in advance due to historic negative experiences, and reliability issues (out-of-service units, vandalism, damage, poor maintenance) amplify anxiety and reduce confidence. Disabled Motoring UK were strongly supportive of bookable charging and clearer, more accessible digital information, including the ability to identify whether a charge point is accessible before travelling and to pay via an app to avoid difficult on-unit payment interfaces.

This aligns with the broader direction of travel towards dynamic kerbside management, where digitally enabled allocation and enforcement can improve predictability in high-pressure and contested locations. Further detail on this approach is outlined in Section 3.2.

2.2.5 Recommendations

The implication from engagement with a wide range of stakeholders tackling different aspects of charge point delivery is that inclusive on-street charging requires an integrated approach which considers all aspects of design, procurement, operations, and data.

The summary recommendations are therefore to:

1. Embed accessibility expectations in procurement and delivery (including accessible heights, orientation rules and cable management expectations for rapid units)
2. Improve data transparency so users can filter charge points by accessibility features (supported by current site photographs)
3. Expand and repeat charge point auditing to track progress and keep datasets relevant as standards evolve.

Where retrospective improvements are feasible, quick wins include:

- Clearer signage indicating where charge points are
- Prominently displayed instructions in accessible formats, and addressing avoidable “installation errors” such as poor orientation or excessive set-back from the kerb.

2.2.6 Emerging solutions to improve accessibility over time

Looking ahead beyond existing practice, stakeholders identified several emerging solutions that could materially improve accessibility outcomes. Wireless charging was consistently framed as the most inherently inclusive option because it removes cable handling altogether, albeit with current cost, technology and deployment constraints.

In the nearer term, bookable kerbside space and demand-led provision (for example, aligning Blue Badge bay allocation with adjacent charge points) could reduce anxiety and help ensure that at least a proportion of installations in any area are genuinely usable. Peer-to-peer domestic charging models (covered in Section 3.3) were also seen as a potentially helpful complement, particularly where trust can be strengthened through community-based schemes.

2.3 Local authority delivery approaches

2.3.1 Overview

Rather than following a single approach, local authorities across the region are adopting distinct approaches in how they approach on-street EV charging. In practice, these are shaped less by overall ambition and more by local political context, kerbside pressure, asset ownership, and internal capacity.

Importantly, most authorities do not sit neatly in one category across all themes. An authority may, for example, be highly mature in procurement and delivery, but cautious in kerbside controls or cross-pavement policy.

To address these conflicting pressures, this section sets out a taxonomy of approaches against which local authorities can judge their desired outcomes and their resulting approach across the different aspects of delivering on-street charging.

Cautious, low-conflict rollout

Some authorities are prioritising pace and political acceptability over prescriptive kerbside management. In this approach, on-street charging is delivered with a deliberately light footprint, often avoiding dedicated EV bays, extensive signage, or TROs unless absolutely necessary. The intention behind this approach is to minimise confrontation over parking loss and reduce the risk of schemes becoming stalled by objection or escalation.

This approach is commonly associated with:

- Lamppost or discrete supplementary post solutions.
- Minimal or no changes to parking controls.
- Reliance on informal compliance rather than active enforcement.

Authorities adopting this approach often see it as a pragmatic response to high parking sensitivity or limited enforcement capacity. However, it can also constrain future flexibility, particularly if higher-power charging or greater turnover becomes necessary. Furthermore, where a more hands-off approach to residents' parking is adopted, local "parking wars" may emerge with no formal means of resolving them.

Table 2.2: Pros and cons of a cautious, low-conflict rollout approach

Pros	Cons
Faster deployment and lower up-front governance burden	Limited ability to manage turnover or prioritise users
Reduced political and community opposition	Risk of informal blocking and uneven availability, leading to conflict
Minimal reliance on enforcement capacity	Harder to retrofit controls as demand grows

This approach aligns best where the strategic ambition is to start building coverage quickly without triggering initial backlash, particularly in politically sensitive or parking-constrained areas.

Scaled residential network builders

A second group of authorities are approaching on-street charging as network infrastructure, with a clear ambition to achieve area-wide coverage for residents without off-street parking.

These authorities tend to articulate clear coverage metrics (e.g. walk-to-charger distances) and are more likely to invest in repeatable delivery models, multi-year pipelines, and structured procurement.

Key characteristics of this approach include:

- A strong focus on lower-power residential charging at scale.
- Structured contracts, often split by power band or use case.
- Increasing use of standardised designs and approval processes.

This approach can offer a more robust response to local challenges and opposition, enabling rollout to proceed in a way that is grounded in policy ambition. Clearly, this requires strong political backing and long-term commitment, which can be challenging in areas with higher levels of opposition and where EV uptake is still low.

Table 2.3: Pros and cons of a scaled, residential network builder approach

Pros	Cons
More equitable and consistent access across neighbourhoods	Higher exposure to consultation fatigue and objection risk
Better value for money through scale and standardisation	Greater reliance on internal capacity and cross-team coordination
Clearer long-term policy articulation, delivery pipeline, and market signal	Slower initial mobilisation where governance chains are complex

This approach aligns best where the ambition is area-wide equity and coverage, effectively treating on-street charging as local utility infrastructure.

Targeted, use-case-led deployers

Some authorities are focusing less on blanket residential coverage and more on specific user needs, such as taxis, fleets, disabled users, or town-centre charging. In these cases, on-street charging is framed as part of a broader transport or economic strategy rather than purely being a residential amenity.

This approach typically involves:

- Selective use of higher-power or dedicated infrastructure.
- Closer coordination with licensing authorities, fleet managers, or disability stakeholders.
- A higher likelihood of formalised parking controls or dedicated bays.

Table 2.4: Pros and cons of a targeted, use-case-led deployment approach

Pros	Cons
Higher utilisation and clear user benefit per installation	Greater political sensitivity if perceived as favouring certain groups
Strong alignment with wider policy objectives (e.g. fleet transition, accessibility)	Higher enforcement and management requirements
Easier to justify dedicated infrastructure for defined needs	Less "coverage benefit" for general residential demand

This approach aligns best where the ambition is to enable specific transitions (e.g., taxis, fleets, accessible users, town-centre turnover) and deliver high impact per site, even if coverage is less uniform.

2.3.2 Selecting an approach

In practice, no single approach will meet all strategic ambitions for on-street charging. The interviews and survey insights collected for this study suggest that the most resilient and effective strategies are those that deliberately combine approaches, selecting the one that best fits local conditions, delivery capacity, and political context.

This section therefore sets out a methodology for selecting the right approach for the right place and bringing this together into an overarching strategy.

1) Be explicit about what is being optimised for

Before selecting an approach, it is helpful to set out the primary objective(s) for the next phase of charge point delivery. In practice, most programmes optimise for a mix of:

- Equitable access for residents without off-street parking.
- Pace and public acceptability.
- High utilisation and clear outcomes for priority users and locations.
- Protection of the public realm and accessibility.

These objectives will vary dependent on the current mix of charging provision and maturity of delivery. Clarity on objectives at this stage reduces policy drift and helps justify trade-offs in public consultation and internal approvals.

2) Let kerbside conditions determine the level of control

Kerbside pressure and local sensitivity should determine how interventionist the strategy can be in different street types. In high-pressure streets, a lighter footprint may be the only viable starting point, whereas in locations where kerbside productivity/turnover or fairness is critical, stronger controls may be needed and justified. The key is to decide this up-front by context (place type and use case), rather than re-opening the restrictions debate for every site.

3) Align choices with enforcement and governance capacity

Where enforcement capability is limited or responsibilities are fragmented, strategies that depend on tight compliance and continual monitoring are not likely to be effective. Conversely, where enforcement is credible, there is greater scope to use parking controls to protect availability and manage dwell time. Similarly, where internal governance is slow due to limited resource, approaches that minimise repeated approvals and create a repeatable delivery pipeline are typically more resilient.

4) Differentiate by place and segment rather than adopting a uniform policy

A practical way to avoid overreach is to define a small number of “delivery contexts” (for example: residential streets, town centres/high streets, transport hubs, and fleet/taxi locations) and apply tailored design and management assumptions to each. This maintains consistency while still responding to local conditions.

5) Treat the approach as adaptive, not fixed

Finally, authorities should view their chosen approach as time-bound rather than permanent. Early low-conflict rollouts can evolve into more managed arrangements as demand grows and public understanding improves. Furthermore, initial targeted deployments can inform wider network expansion. Building in review points linked to utilisation, complaints, and operational performance allows strategies to mature without reopening fundamental policy debates.

2.4 On-street charging typology

2.4.1 Introduction

Having set out how local authorities can select an appropriate strategic approach based on ambition, kerbside context, and delivery capacity, the next step is to consider how that approach translates into physical infrastructure on the street.

In practice, the choice of approach is realised through decisions about charger hardware type, power level, and siting, each of which interacts differently with street layout, parking controls, accessibility requirements, and user behaviour. No single charger type performs well in all contexts. Instead, different solutions are better suited to particular place types and use cases, depending on the balance between coverage, turnover, visibility, and kerbside impact.

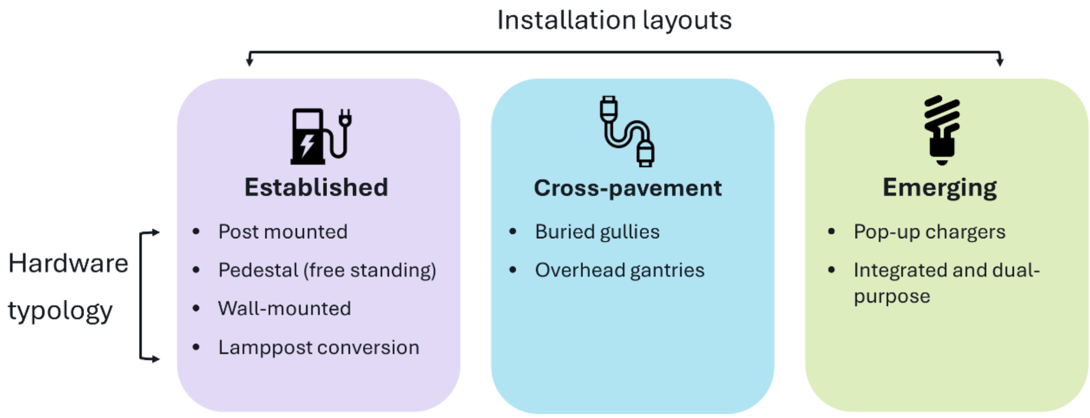
The on-street charging typology that follows therefore does not present a hierarchy of "better" or "worse" solutions. Rather, it provides a practical mapping between hardware types and the places they work best, drawing on the interview and survey insights to show how authorities are matching infrastructure to residential streets, town centres, destination sites, transport hubs, and specialist user needs.

This typology is intended to support place-based decision-making, helping authorities move from high-level strategic approaches to implementable, defensible choices on the ground.

2.4.2 Hardware types

As illustrated in Figure 2.1, three principal kerbside installation layouts are considered: established, cross-pavement, and emerging solutions.

Figure 2.1: On-street charger type by installation layout and hardware typology

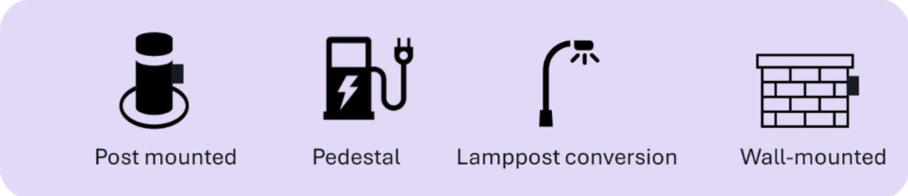


Each layout category contains several hardware typologies, reflecting different engineering approaches, design objectives, spatial footprints, and levels of interaction with the pedestrian environment. These differences influence accessibility, maintenance, installation cost, and the extent to which each charger integrates, or conflicts, with existing urban infrastructure.

Established

Four established kerbside hardware types are considered in this section: post mounted, pedestal, lamppost conversions and wall-mounted (Figure 2.2).

Figure 2.2: Hardware typologies of 'established' kerbside chargers



The table below outlines the charger types and their key attributes.

Table 2.5: Established kerbside chargers

Charger type	Image	Description	Key attributes
Post mounted chargers		Small footprint units installed at the pavement edge, which can be integrated into kerbside features, such as bollards, for aesthetics.	• Compact but can still obstruct pedestrian flows if poorly sited. • Clustering can add street clutter; cable management requires careful positioning to minimise trip hazards. • Generally lower-power installations
Pedestal chargers		Larger, free-standing cabinet containing one or more charge points, typically placed at the kerbside or in the carriageway potentially on a small build-out	• Larger physical footprint and greater visual impact than bollards. • Higher installation cost due to civil works and reinforced bases. • Can offer higher utilisation but with increased maintenance complexity. • Higher-power installations
Wall mounted chargers		A compact charger installed on the façade or boundary wall of an adjacent building but made accessible from the street.	• Minimal street clutter since no ground-mounted infrastructure is required. • Dependent on suitable host walls and property-owner permission. • May require cables to cross the footway, impacting safety and accessibility.
Lamppost conversions		These chargers incorporate charging hardware inside or attached to existing streetlight columns	• Low-cost, low-impact installations with no additional street furniture. • Intended for overnight or long-dwell charging due to lower power outputs. • Potential trip hazards if the adjacent parking position cannot be guaranteed and if lamppost at the back of the footway.

Cross-pavement

Cross-pavement solutions focus on safely routing a charging cable across the footway between a property and a parked vehicle. Two approaches are considered: buried gullies/cable channels and overhead gantries (Figure 2.3).Table 2.6

Figure 2.3: Hardware typology of cross-pavement kerbside chargers

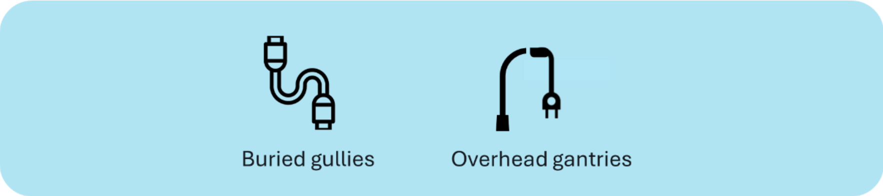
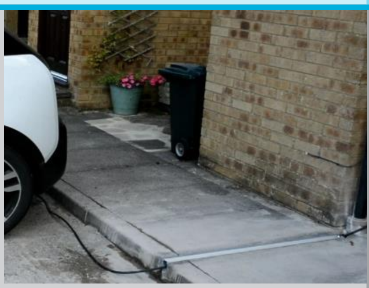


Table 2.6 presents these charger types and associated key attributes.

Table 2.6: Cross-pavement kerbside chargers

Charger type	Image	Description	Key attributes
Buried gullies		Engineered channels recessed into or across the pavement surface that allow a charging cable to run flush with or below the footway between a home-based charger and a vehicle parked at the kerb.[3]	• Very low visual impact; fully integrated into the pavement surface. • Require careful installation to maintain drainage and structural integrity. • Residual trip risks if channels are not cleared; responsibilities for upkeep must be defined. • Access to a cross-pavement gully may create a perception of informal entitlement to the adjacent on-street parking space.
Overhead gantries		These chargers use a mechanical, retractable arm, wall-mounted or freestanding, to suspend and guide a charging cable above the pavement, enabling residents to charge from a home EVSE without trailing cables	• Minimises trip hazards by lifting the cable. • Introduces more visible street infrastructure. • Requires reliable user operation to maintain safety and clearance • Access to an overhead gantry may create a perception of informal entitlement to the adjacent on-street parking space

[3] As an interim alternative, armoured mats can be placed on the surface to protect a charging cable as it crosses pavements, pedestrian areas, or roads. These mats contain a high-strength, anti-slip protective channel that safely encloses the cable without requiring any excavation.

Emerging

Emerging on-street charging solutions, in this context, refer to technologies that differ from conventional kerbside or cross-pavement installations. This includes pop-up or flush-fit units, which remain hidden beneath the pavement when not in use, and integrated or dual-purpose chargers, which combine EV charging with other street infrastructure or multifunctional hardware (Figure 2.4).

Figure 2.4: Hardware typologies of emerging kerbside chargers

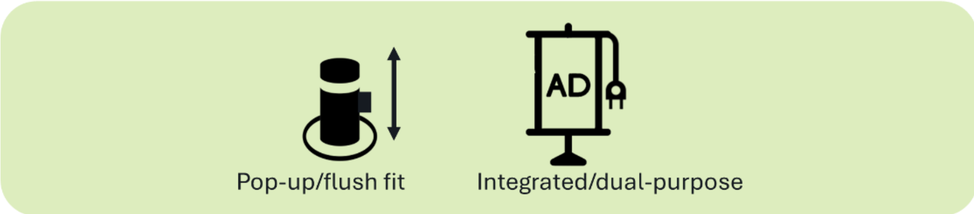


Table 2.7 gives an overview of these typologies and their key attributes.

Table 2.7: Emerging kerbside chargers

Charger type	Image	Description	Key attributes
Pop-up or flush-fit		Units installed beneath the pavement, remaining level with the ground surface when not in use. They rise mechanically or via a user-operated mechanism when charging is required. Example systems, such as Trojan Energy use a portable adaptor inserted into a sunken pavement socket.	• No permanent above-ground footprint, reducing clutter and visual impact. • Avoid obstruction when retracted.
Integrated or dual-purpose		These chargers incorporate EVSE into other pieces of street infrastructure (**Error! Reference source not found.**). They may combine charging with services such as local information displays, advertising panels, or battery storage for grid management. Examples include JOLT and BrightGreen's kerbside systems.	• Reduce clutter by consolidating multiple street functions into one structure.

Hardware typology considerations

Each of the charger types described above presents different characteristics in terms of technical specification, installation cost, accessibility, non-user impacts, and overall safety performance.

When comparing charger typologies, it is helpful to consider a set of characteristics that influence not only technical performance but also how infrastructure functions in real streets and for different users. The following factors are particularly relevant when thinking about suitability across contexts:

- **Installation cost**: This can include civil works, ground excavation, cabling requirements and any upgrades to electrical infrastructure. Some solutions, such as lamppost conversions that are close to the kerb, may require relatively minimal works, whereas more engineered options (e.g. flush-fit or pop-up units) can involve more complex installation and therefore higher costs.
- **Maintenance needs:** Different designs vary in how much inspection, servicing and upkeep they require. Typical maintenance considerations include checking for vehicle impact damage, signs of overheating, functioning payment terminals, signage, water ingress or deterioration of electrical components. Simpler, lower-power units often have lower maintenance needs, while standalone pillars may require more regular inspection.
- **User accessibility:** Accessibility considerations can include siting (avoiding obstruction of footways or dropped kerbs), mounting height, the reach and ease of handling of charging cables, and risks of trip hazards if cables need to cross the pavement. These features can materially affect how well a typology serves a wide range of users, including disabled users.
- **Non-user impacts:** Chargers can also affect people who are not using them. Factors to consider include potential street clutter, reduced pedestrian space, visual impacts, and risks from trailing cables in some configurations. Some typologies can help minimise clutter by consolidating functions, while others may introduce additional physical elements into the streetscape.
- **Safety:** While all charging infrastructure must meet relevant safety standards, designs vary in how they manage public-realm risks such as tripping hazards, exposure to moving parts, or water ingress to electrical components. These risks are generally low but can differ depending on complexity and siting.

Table 2.8 presents an overview of the different hardware types and their attributes.

Hardware summary table

The ratings assigned to each typology is a typical or average and relative rating compared to the other typologies in Table 2.8. Individual manufacturers or installation designs may perform better or worse. While the preceding sections provide brief introductions to these features, the table below summarises the key differences at a high level to support comparison across typologies. A detailed comparison of charger typology technical specifications and attributes is provided in Appendix B.

Table 2.8: Summary of charger types with technical specifications and attributes

Charger type	Power (kW)	Installation cost	Maintenance	User accessibility	Non-user impacts	Safety
Post mounted	7-22	££	££	●●●○	●●○○	●●●○
Pedestal	7-350	£££	££-£££	●●●○	●○○○	●●●○
Wall-mounted	7-22	£	£	●●○○	●●●●	●●○○
Lamppost conversion	3-7	£-££	£	●●○○	●●●○	●●○○
Buried gullies	3-7	££	££	●●●○	●●●●	●●○○
Overhead gantries	3-7	££	££	●●●○	●●●●	●●○○
Pop-up/flush fit	7-22	£££	£££	●●●○	●●●●	●●○○
Integrated/dual-purpose	3-25	£££	£££	●●○○	●●○○	●●○○

2.4.3 User types in different environments

Given that each type of charger has distinct characteristics, some solutions are naturally better suited to particular user needs and settings. To illustrate this, we consider four representative user types:

- Light commercial vehicle (LCV) and heavy goods vehicle (HGV) drivers
- Disabled users
- Private car users
- Taxi/PHV (private hire vehicle) drivers

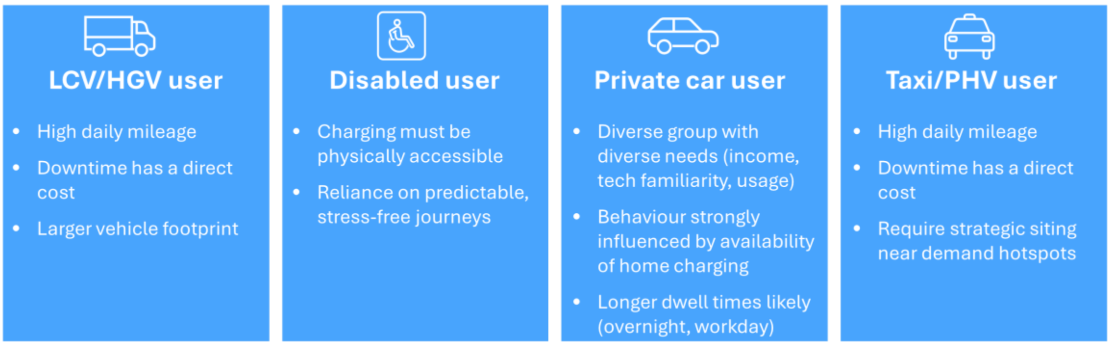
These are considered across three on-street environments: urban, urban residential, and suburban residential areas.

Before assessing which charger types align best with each user-environment combination, it is important to understand both the charging requirements and practical constraints associated with each user type, as well as the physical and operational characteristics of the different environments.

Figure 2.5 below illustrates how user characteristics shape charging behaviours and needs. For example, users with high daily mileage and time-sensitive operations, such as LCV/HGV drivers and taxi/PHV drivers, place a premium on fast, reliable charging that minimises downtime and supports predictable scheduling.

In certain circumstances, HGV operators may require access to public on-street charging, including within loading bays, to enable “top-up” charging. This may arise where operators lack dedicated depot facilities, rely on third-party, client or shared sites with constrained charging provision, or face complexities in leasing and fleet arrangements that limit the installation of private infrastructure. In these contexts, public charging can provide a complementary source of operational resilience.

Figure 2.5: User types and characteristics



While users have different charging needs, the environments where charging can occur also vary significantly and introduce their own constraints (Figure 2.6). Urban centres often have limited kerb space, high footfall, and competing demands, restricting where chargers can be placed. Residential streets may accommodate longer dwell times but often have narrow footways or inconsistent parking patterns. Suburban areas typically have more space, but less certainty of demand.

Figure 2.6: Environment types and constraints

- To understand how charger typologies align with real-world needs, it is useful to consider how each user type interacts with different street environments. Table 2.9 below summarises the key implications of these user-environment interfaces, highlighting how operational patterns and physical context combine to shape charging requirements. For a more detailed exploration of how user type and environments interact see **Appendix A.**

Table 2.9: Interface between user characteristics and environmental constraints

(Key**: user requirements in bold,** *non-user/LA requirements in italics*).

Environment	User type			
	LCV	Disabled user	Car	Taxi/PHV
On-street urban centre	**Ultra-fast charging**	**Guaranteed accessibility + reliability + clear, protected space**	**Convenience**	**Ultra-fast charging + predictability + queue avoidance**
	Minimal kerb impact + high utilisation	*Protected bay enforcement + misuse prevention*	*Turnover + kerbside efficiency*	*Queue management + traffic flow protection*
On-street urban residential	**Predictable access + longer dwell**	**Guaranteed accessibility + certainty of access**	**Long-dwell compatibility + cost effectiveness**	**Predictable access**
	Residential compatibility	*Wider residential compatibility*	*Equitable access + scalable deployment*	*Controlled residential impact*
On-street suburban residential	**High reliability + overnight energy sufficiency**	**Guaranteed accessibility + maximum reliability + proximity to home**	**Reliable coverage + cost effectiveness**	**High reliability + overnight energy sufficiency**
	Low-density compatibility	*Accessible design compliance*	*Efficient coverage per charger*	*Cost-proportionate provision*

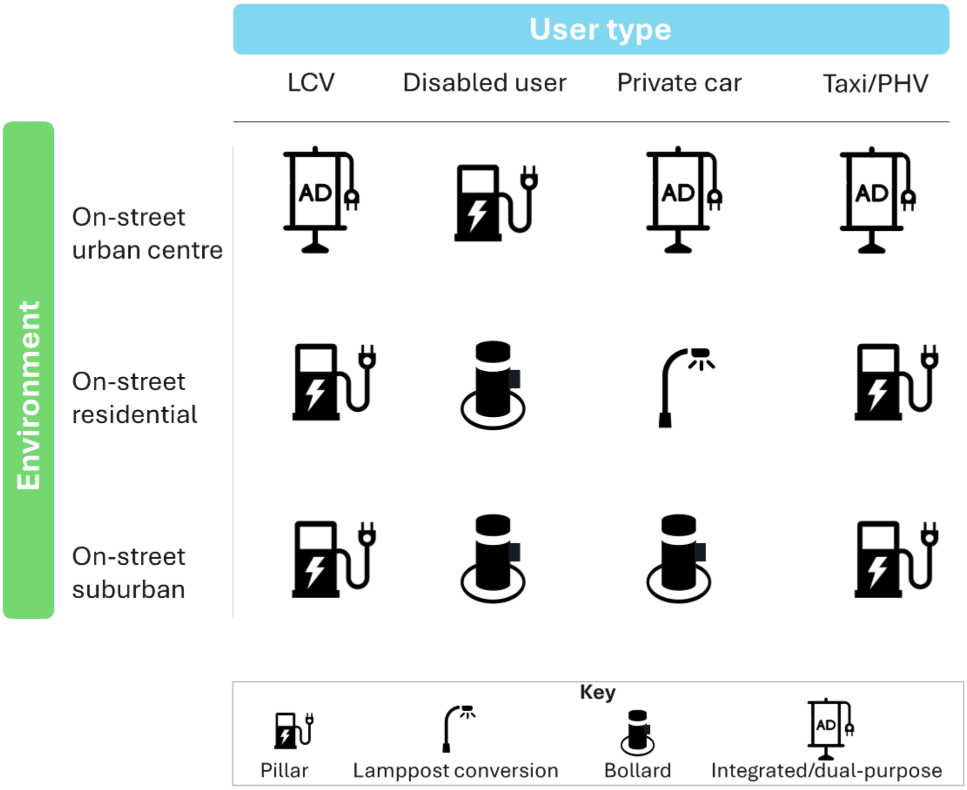
2.4.4 Charger typology matrix

The charging requirements identified in Figure 2.7 help illustrate how certain charger typologies become more suitable for specific combinations of user type and environment. For example, a commercial LCV operator in an on-street urban centre faces both high charging demand and acute space constraints. Their vehicles have a larger footprint and limited downtime, so they place a premium on faster charging and assurance that their vehicle can be accommodated by the kerbside.

At the same time, local authorities may weigh different considerations, such as minimising visual and physical impacts on already constrained street space. In this context, an integrated or dual-purpose charger can be an effective option as it can support higher charging speeds, consolidate functions into a smaller kerb footprint (e.g. charging and advertising or information), and may offer revenue models that help justify the use of valuable street space.

The matrix below summarises which charger typologies are likely to be well aligned with the charging requirements of different user groups across the on-street environments considered in this section. Full reasoning for each user-environment pairing is provided in **Appendix C**.

Figure 2.7: Charger typology matrix



These suggestions are not prescriptive but instead offer a framework for thinking about overall suitability. While an integrated dual-purpose charger may work well in the LCV example discussed above, it is not the only viable option. Small rapid-charging hubs near delivery hotspots, for example, could equally serve commercial users efficiently. The recommendations should therefore be interpreted as indicative rather than definitive.

Finally, although cross-pavement solutions do not appear in the typology matrix, this does not imply they are unsuited to the scenarios considered. In many on-street residential contexts, especially where other kerbside solutions are not feasible, gullies or overhead gantries can offer an effective low-cost and low-clutter way for residents without driveways to charge.

In this context, cross-pavement solutions are distinct from other on-street charging typologies in that they do not contribute to the public charging network. Each installation is tied to an individual property, serving a single household's vehicle parked directly outside. This fundamentally changes their function and the policy considerations that apply.

Unlike lamppost chargers or post-mounted units, which are accessible to any driver, cross-pavement solutions create a de facto private charging arrangement on public highway, raising questions around kerbside entitlement, neighbour disputes, accessibility, and highway liability that simply do not arise in the same way for shared public infrastructure.

While some providers are developing platforms to enable neighbours to share access, this remains an emerging and unproven model. For this reason, cross-pavement solutions are better understood as a complement to the public charging network that address a specific equity gap for households without off-street parking, rather than as part of it.

2.5 Policy recommendations and toolkit

When defining an overall policy for delivering charging infrastructure to define and clarify the intended outcomes of EVI, which are typically around enabling an equitable transition to zero emission vehicles. Infrastructure should consider the proportion of vehicles that are EV in the area and how this is forecast to change over time. Importantly, it should also consider how the infrastructure might impact other members of the public including non-vehicle users.

This toolkit provides guidance to ensure that the LA is thinking about meeting the needs of different user types and across different types of locations. Plans for EVI development should also consider the political, economic, social and technological trends likely to impact future demand (see Table 2.10Table).

Table 2.10: Political, Economic, Social and Technological (PEST) analysis of factors that could impact charging need/demand and requirements over time.

Political	Economic	Social	Technological
Changes in regulations and policy that impact CPO cost base for operating public charging networks will impact the cost of public charging and hence people’s behaviour on where/how they charge.	For certain segments, the cost of charging will be the key driver in how they choose to charge.	As more of the population transitions to EVs, the typical behaviour of the ‘mass market’ and the ‘laggards’ will be different to the ‘early adopters’.	Advancements in battery technology including greater energy density/range, faster charging, and improved efficiency could reduce the frequency and amount of charge needed by typical vehicles.

3 Emerging and alternative solutions

3.1 Overview

Part 1 of this report set out the current landscape for on-street charging across the TfSE region, including the operational, social, and spatial pressures that can constrain delivery and day-to-day management.

Building on this understanding, Part 2 shifts the focus to emerging and complementary approaches that can help relieve pressure on limited kerbside capacity by enabling access to charging elsewhere, and/or through shared models that reduce reliance on dedicated on-street residential infrastructure.

The emphasis in this part of the report is on identifying solutions that are both scalable and equitable, particularly for households without off-street parking, and assessing what it would take for these approaches to move from isolated trials into more routine local delivery. This includes considering practical feasibility (technical and operational), policy and regulatory fit, and the commercial and governance arrangements required for implementation at scale.

3.2 Digital TROs and dynamic kerbside management

3.2.1 Overview

Dynamic kerbside management (DKM) is an emerging approach enabling local authorities to improve the productivity of the kerbside in areas of high demand where space is limited. Rather than treating charge points as passive assets, DKM introduces an operational management layer that determines who can use a bay and the adjacent kerbspace.

A useful way to frame DKM in the context of on-street charging is as a means of managing the interface between charging and other kerbside uses (loading, servicing, taxis/PHV, blue badge access, residents' parking, and short-stay activity), using time-based rules and digitally managed permissions, rather than relying solely on static lines and signs.

In doing so, it can help address issues that suppress the value of on-street charging, including "ICEing" (internal combustion engine (ICE) vehicles parking in EV charging bays and blocking access to chargers), uncertainty over availability, unclear user entitlement, and inefficient enforcement. This can enable the kerbside to be more productive, flexibly serving different purposes throughout the day in response to demand and/or policy objectives for the area.

This approach requires the traffic regulation orders (TROs) that underpin the signs and lines to be digitised (D-TROs) to enable booking and management systems to refer to a single authoritative record that can be updated as per the policy intentions of the highway authority. More information on this approach can be found in Section 3.2.4.

NB: It should be noted that, while the concept of DKM is technically credible and commercially plausible, real-world deployment specifically applied to EV charging remains very limited. To date, evidence of end-to-end DKM implementation (integrating booking controls, enforcement workflows, and charging entitlement) is largely confined to small-scale pilots and proof-of-concept trials, rather than sustained operational programmes.

Within the South East and London, activity is at an early stage. Engagement for this study identified interest and exploratory work among a small number of authorities, but no established, fully operational DKM schemes specifically for EV charging bays at the time of writing.

The components exist and have been tested in adjacent contexts (kerbside booking for logistics, D-TRO integration with enforcement), but assembling them into a coherent, scalable charging-focused offer remains work in progress.

Authorities considering DKM should therefore treat it as a near-term pipeline opportunity rather than an off-the-shelf solution and engage closely with platform providers and enforcement partners to understand readiness in their specific context.

3.2.2 How DKM works in practice

Dynamic kerbside management can enable authorities to achieve several policy objectives. Stakeholder engagement highlighted a clear opportunity to use booking functionality to guarantee the availability of a charge point at a particular time. This can help improve reliability for users and therefore uptake and help to prevent ICEing or informal use of bays.

Public on-street charging utilisation rates were described by several stakeholders as averaging in the mid-teens, with booking often presented as a mechanism to improve dependability for users and increase asset productivity.

However, views were not consistent across interviewees, and booking was seen by some as appropriate only where utilisation is already relatively high or where there is a clear operational need (e.g. for commercial vehicles).

Concerns included “ghost bookings” (a bay appearing unavailable despite being physically empty), reduced ability of drivers to turn up and use a bay without pre booking and user frustration.

Fleet-specific challenges included driver/vehicle uncertainty (leading to bookings tied to the wrong vehicle registration and potential penalties), previously booked vehicles overstaying their slots and the need for tolerance around lateness (e.g. due to congestion) to avoid punitive fees and unintended non-compliance.

In practice, the enabling components of dynamic kerbside management include:

- **Booking and entitlement controls** allow the authority (and/or operator) to define who is permitted to occupy an EV charging bay during a defined time window. Where integrated with charging protocols such as OCPP or OCPI[4], the kerbside permission (a booking) can be aligned with the right to charge, reducing ambiguity and improving user compliance.
- **Occupancy and compliance** can be established through a combination of bookings data, enforcement observations, and physical infrastructure. The engagement noted that DKM can function without additional street hardware, using bookings and enforcement integration as the primary mechanism, with smart signs, ANPR integrations, or physical access controls used where they materially improve legibility and behaviour change. Some associated trials have also included rising bollards or even illuminated road markings which can display different colours to communicate the availability and intended use of the bay.
- **Conflict management features** are also enabled through DKM, including the ability to manage displacement through “virtual” or contingency bays. If a booked bay is obstructed, the system can alert enforcement and redirect the user to a nearby alternative (often unmarked) that has been pre-agreed with the highway authority in the relevant TRO. This is particularly valuable where drivers (including commercial vehicles) would otherwise circulate to find alternative parking.
- **Effective enforcement** is critical to the success of DKM. Without clear, consistent and enforceable rules, time-based or shared-use kerbside arrangements risk becoming ineffective in practice, undermining user confidence and reducing the operational value of EV charging and other kerbside functions.

DKM can be most impactful where kerbside friction is currently limiting the effectiveness of charging, or indeed restricting its implementation due to the need to retain access for other purposes. In addition to acting as a booking tool for charge points, it can also support decisions about how charging co-exists with other kerbside priorities, including throughout the day.

3.2.3 Changing uses throughout the day

Rather than treating the kerb as fixed-purpose parking, DKM allows it to be managed as a high-value public asset that supports local businesses, access needs, and street vitality at different points in the day. The streetscape remains physically stable (same frontage, same kerbline, and charging infrastructure), but the priority use changes through clear rules, variable signage, and digital controls and enforcement.

Figures 3.1-3.3 show how a single, consistent stretch of kerb can be reallocated across three time periods to reflect changing demand and use to benefit people, places and movement.

[4] OCPP is the protocol that connects a charge point to its operator's back-office system. OCPI is the protocol that connects different operators' systems to each other, enabling roaming and cross-network access

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Morning

In the morning, the kerb is configured as a bookable loading and servicing space for the adjacent pub and convenience store, with the charging bay available to support short dwell-time “charge while you work” activity for commercial vehicles (Figure 3.1). Previous engagement with logistics industry representatives has indicated a willingness to pay for assured access to loading space in congested spaces to avoid costly failed delivery attempts.

Figure 3.1: Morning (7 AM–11 AM): deliveries and charging for servicing activity

The benefits for people, place, and movement are listed in Table 3.1 below.

Table 3.1: Morning (7 AM–11 AM) - deliveries and charging for servicing activity

Category	Description
People	• Reduces conflicts on footways by enabling compliant, close-to-frontage servicing, minimising the temptation for informal parking, double-parking, or unloading across pedestrian desire lines. • Supports safer pedestrian movement at peak times by reducing opportunistic stopping and obstruction
Place	• Helps the pub and convenience store operate efficiently and enables reliable stock replenishment. • Enables quicker turnaround for deliveries, reducing overall dwell time and street clutter on the pavement by loading direct to the premises
Movement	• The charger provides a ‘grazing’ opportunity for an electric delivery vehicle, providing them with extra range and redundancy in their delivery round • Improves network efficiency and air quality by reducing circulating vehicles looking for somewhere to stop, and by discouraging loading in live lanes.

Afternoon

In the middle of the day, the kerb shifts to prioritise public access to the EV charger alongside the creation of a dedicated Blue Badge space (Figure 3.2). This reflects the need for higher discretionary trip-making, errands, and daytime appointments, as well as a need to balance charging access with inclusive kerbside provision.

Figure 3.2: Afternoon (12 PM–4 PM): public charging and accessible (Blue Badge) parking

The benefits for people, place, and movement are listed in Table 3.2 below.

Table 3.2: Afternoon (12 PM–4 PM) - public charging and accessible (Blue Badge) parking

Category	Description
People	• Improves accessibility by providing a predictable, protected Blue Badge space close to key destinations, supporting independent travel for disabled people. • Increases fairness in charging access by reserving space for active charging, reducing charger blocking (ICEing) and improving confidence for drivers who rely on public charging.
Place	• Supports daytime footfall by making it easier for people to stop briefly, access local services, and spend time on the high street. • Helps normalise charging infrastructure as part of the everyday streetscape without creating all-day dominance of kerb space by a single user group.
Movement	• Increases charger utilisation by aligning availability with daytime demand (potentially for employees of the adjacent businesses), improving the productivity of the asset and reducing wasted kerb capacity. • Reduces unnecessary circulation associated with searching for charging or convenient parking, particularly in constrained local centres.

Evening

In the evening, the kerb is reallocated from vehicle storage to offering outdoor seating for the pub, creating a clear "place-led" outcome when freight demand drops and social activity increases (Figure 3.3). In this configuration, the kerbside can contribute to local economic vitality without permanent road space reallocation.

Figure 3.3: Evening (6 PM–10 PM): outdoor dining and a more vibrant street

The benefits for people, place, and movement are listed in Table 3.3 below.

Table 3.3: Evening (6 PM–10 PM) - outdoor dining and a more vibrant street

Category	Description
People	• Creates additional, public, social spaces, supporting informal community interaction and improving perceived safety through passive surveillance and activity. • Offers more choice and capacity for customers, improving the quality of local hospitality venues.
Place	• Enhances local character and street vibrancy, contributing to a stronger evening economy and a more attractive destination. • Demonstrates visible, tangible value from kerbside management. The same space supports commerce and community at different times, rather than sitting underused.
Movement	• Reduces competing evening kerbside demands (e.g., short-stay parking pressure) by providing a clear, managed, policy-aligned alternative use. • Helps manage congestion around peak leisure periods by limiting informal stopping and creating a more orderly kerbside arrangement.

3.2.4 Digitisation of TROs and the emerging regulatory approach

DKM does not replace D-TRO platforms. Instead, it sits downstream, using legally defined kerbside rules (permitted users, time windows, restrictions) via API integration and translating them into bookable, enforceable capacity on the highway.

This supports a “single source of truth” approach, where the legal basis is clearly defined while operational allocation can be managed more dynamically. Where D-TRO coverage is incomplete, DKM platforms may be able to populate kerbside assets and rules temporarily, but this is positioned as a fallback rather than a preferred long-term approach.

AppyWay, a D-TRO management platform, described a proposition centred on presenting a transparent and current view of restrictions (including tariffs and dual-use), and live feeds to enforcement partners. For EV charging specifically, the platform can publish bay inventories to CPOs and support live dashboard reporting to track progress against targets.

Following the engagement for this project, two practical points are worth emphasising:

- **Data quality and consolidation:** D-TRO maturity and consolidation of orders are prerequisites for dependable kerbside planning and managed operations, and councils may need a survey to reconcile legal records with the on-street reality. Many councils maintain a bank of PDFs with non-standardised descriptions of kerbside permissions, making it challenging to get a strategic understanding of kerbside allocation across an area.
- **Data model gaps can affect charging typologies:** EV bays can be represented in D-TRO management platforms, but not all forms of infrastructure are currently shown. AppyWay noted the absence of a specific lamppost charging restriction category at present, and that gully charging is not yet consistently adopted across boroughs (with corresponding impacts on standardised categorisation).

Regulatory readiness

Policy and regulatory readiness are still developing. AppyWay noted that D-TROs have been made mandatory in primary legislation, but that the absence of a DfT deadline slows uptake in some authorities, and that slower progress on the National Parking Platform (NPP) affects the scale of nationally interoperable consumer-facing services. This points to varied states of readiness across the TfSE area and reinforces the need for staged approaches that match interventions to governance maturity and operational capacity.

Table 3.4 shows the LTAs within the TfSE area currently using D-TROs (according to each platform’s website).

NB: It should be noted that the current TRO regime was not designed for flexible use of the kerb, and therefore a ‘workaround’ approach is required to deliver a kerbside that can be managed flexibly, as opposed to fixed yet timed restrictions.

TRO documents in existing pilots are worded to allow ‘permitted vehicles only’, with a whitelist of users managed via the DKM platform, linking through to enforcement/entitlement databases.

Table 3.4: TfSE LTAs utilising D-TRO platforms.

Evidenced on D-TRO websites	Not evidenced on D-TRO websites
Traffweb (Buchanan/Causeway) client hub: • Bracknell Forest Council • Hampshire County Council • Kent County Council • Portsmouth City Council AppyWay Streets authority list (streets.appyway.com) • Eastbourne • East Sussex – Hastings • East Sussex – Lewes • East Sussex – Rother • Southampton City Council	• Brighton & Hove City Council • East Sussex County Council (separate from the district entries under AppyWay) • Isle of Wight Council • Medway Council • Reading Borough Council • Royal Borough of Windsor and Maidenhead • Slough Borough Council • Surrey County Council • West Berkshire Council • West Sussex County Council • Wokingham Borough Council

Technology readiness

From a technology readiness perspective, stakeholder engagement evidenced that booking-led checks and enforcement integrations are operationally credible now, particularly where enforcement partners can use live restriction and booking data. DKM platforms are framed as a digital overlay on existing bays rather than a new enforcement regime.

Integration of booking platforms with enforcement workflows has already been proven, linking D-TRO platforms with handheld devices used by parking enforcement officers. Where such integrations are not available, variable digital kerbside signage can be used to indicate current and upcoming bookings to users and enforcement officers.

Bay occupancy status can be confirmed through several approaches including ANPR cameras and AI-powered camera monitoring solutions capable of tracking multiple user classes, their locations, and trajectories. In some locations, floor-mounted sensors have been employed, however these are more expensive and provide less functionality.

Commercial readiness

Commercially, stakeholder engagement identified several plausible routes to market for integrating DKM with on-street charging, including local authority-led procurement with revenue sharing; CPO-funded access to booking functionality in return for improved utilisation; and blended models combining booking fees with charging tariffs.

The most appropriate model is likely to vary by location depending on demand intensity; existing contractual arrangements between authorities, D-TRO/DKM providers, and CPOs; and policy priorities (including equity considerations). It should be noted that the willingness to pay for bookable loading bay functionality should be verified through engagement ahead of delivery, as not all locations face the same degree of pressure at the kerbside. The addition of EV charging opportunity, however, strengthens this for operators of electric fleets, as well as providing an additional revenue stream outside of deliver windows.

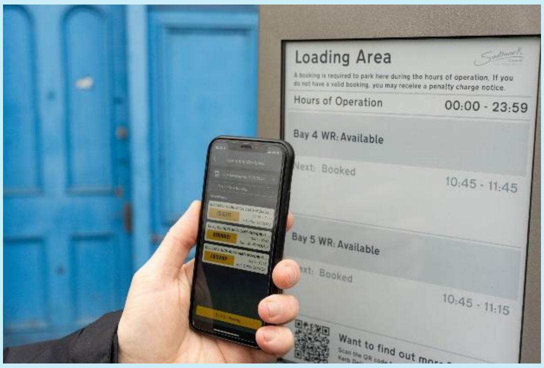
A key guidance point is that benefits are distributed across multiple parties (LTAs, CPOs, enforcement, delivery and servicing providers, and users), so delivery at scale will require explicit alignment on roles, data sharing, customer service responsibilities (e.g., booking errors and enforcement), and the intended balance between operational efficiency at the kerbside and inclusive access.

Case study: Transforming freight deliveries through bookable kerbspace in the London Borough of Southwark

In partnership with Southwark Council, Grid Smarter Cities has introduced a dynamic, bookable kerbside management system on one of London's busiest high streets.

Through the Kerb® Delivery platform, drivers can pre-book loading bays and rely on real-time e-ink signage and enforcement-backed compliance, reducing circling, congestion, and conflicts with other road users. To complement this offering for larger fleets, a web-based platform is also available to support fleet operations staff in managing logistics movements remotely. Five bays, including one for HGVs, provide round-the-clock access and support a wide range of business needs.

Figure 3.4: Kerb® app in use on Walworth Road



Source: Grid Smarter Cities

More than 40 freight operators now use the system, weekly bookings continue to rise, and businesses report higher first-time delivery success. The kerbside booking scheme has also led to fewer penalty charges, which demonstrates that a more controlled loading environment has been achieved in a busy area, and has enabled a more targeted enforcement approach to improve efficiency.

Figure 3.5: Dynamic signage on Walworth Road displaying booking information

Source: Grid Smarter Cities

3.2.5 Practical guidance: where DKM is most likely to add value

One of the strongest use cases identified for integrated DKM and charging is commercial and fleet activity, where vehicles dwell at the kerbside for sufficient periods to support opportunity charging while delivering, collecting, or servicing. By allowing a vehicle to work and charge for longer periods of time, more deliveries to the area can be made on foot, reducing circulation and interactions with the kerb, and therefore pressure on surrounding streets.

By contrast, residential lamppost or bollard contexts are more complex. These locations often lack clearly defined TRO-based bays, and booking-led control can be harder to communicate and enforce, and may be less acceptable where charging is intended to remain open-access.

This does not rule out DKM in residential contexts, but it suggests a more cautious, phased approach, with careful attention to legibility, fairness, and the wider streetscape and accessibility impacts.

When specifying a dynamic kerbside, the following points should be considered:

- **Start with the right locations.** Prioritise areas where kerbside conflict and reliability issues are clearly constraining charging outcomes (often mixed-use and commercial corridors), rather than deploying DKM where demand is still low and governance is limited.
- **Confirm the legal and data baseline.** Ensure TRO restrictions, bay extents, and operating hours reflect the on-street reality. This is best-achieved through a D-TRO management platform to provide a transparent and accessible single source of truth.
- **Implement booking and entitlement with clear enforcement.** Make it straightforward for enforcement teams to verify entitlement and ensure the customer experience includes mechanisms to reduce avoidable disputes (e.g., booking amendment windows, clear rules on overstays and associated penalties).
- **Tailor the commercial model to local objectives.** Decide early whether the primary value is utilisation uplift, reduced operational burden, improved compliance, user assurance, or revenue generation, and structure contracts and data-sharing accordingly.

In summary, DKM is emerging as a credible solution that can materially improve the management of on-street charging, particularly where the key challenge is not the absence of infrastructure but the operational frictions and kerbside conflicts that undermine its performance.

It should, however, be presented as part of a staged pathway, contingent on D-TRO maturity, data quality, and platform integration across enforcement and CPO systems, with careful attention to inclusive access and wider kerbside impacts.

3.3 Shared domestic charging

3.3.1 Overview

Shared domestic charging refers to a set of models that enable EV drivers, particularly those without access to private driveways, to charge using home chargers owned by other households or installed in shared neighbourhood spaces. It sits between fully private home charging and public on-street charging, offering a low-cost, community-based complement to local public networks.

Peer-to-peer platforms such as Co-Charger, JustCharge/JustPark, Joosup, and Trojan Home allow residents to share under-utilised domestic chargers, helping to expand access to affordable, near-home charging. Co-Charger primarily supports commercial drivers who require regular, repeat bookings; Trojan Home focuses on shared pavement-level access to domestic-tariff charging; and Joosup and JustCharge provide flexible, community-based booking models.

Shared domestic charging is not a substitute for delivering kerbside infrastructure; rather, the two approaches are complementary. These models can support early uptake where infrastructure is limited and provide low-cost flexible access to users. Both approaches need to be promoted in parallel, and when deployed in a targeted way, such models can help to bridge the gap between infrastructure supply and charging demand.

3.3.2 Enablers and barriers

Shared domestic charging only works at scale where a set of enabling conditions line up across people, infrastructure, and platforms. The section below sets out the findings from engagement with shared domestic charging operators, highlighting the key enablers and barriers that determine whether peer-to-peer and pavement-access models can move beyond niche uptake and become a meaningful complement to kerbside provision.

The assessment is structured around four themes:

- User adoption and accessibility
- Technical and operational feasibility
- Governance, legal and regulatory frameworks
- Digital systems, data and payments

These factors shape where shared domestic charging is most viable, and the extent to which it can bridge short-term gaps in local charging availability whilst on-street networks mature.

User adoption and accessibility

Shared domestic charging works best where participation is structured to build trust and reliability. One important enabler is managed or semi-exclusive sharing, where hosts limit the number of chargees they accept. Evidence from platforms such as Co-Charger suggests that hosts often cap participation at around three regular users, which helps reduce concerns around misuse, improves confidence in availability, and supports repeat, predictable charging behaviour.

Targeted commercial partnerships further enable user adoption by aligning shared charging with clearly defined demand. Co-Charger's partnership with Allstar illustrates how using data such as postcodes to match suitable hosts with LCV drivers can overcome awareness barriers and focus provision on users most likely to benefit. Similarly, LCV drivers are likely to be users of Allstar's payment services.

Despite these enablers, awareness of shared domestic charging remains low. Many residents are unfamiliar with the concept or its benefits and may not realise that a variety of charger types and access models can meet different needs. On the flip side to this, users can be easily disincentivised by adding complexity like multiple charger types.

Physical access barriers also constrain uptake, particularly where pavement crossings, narrow footways, or awkward parking geometries make private-to-public access more difficult. Coverage is also uneven, with networks still too sparse in many areas to be genuinely convenient for users. Co-Charger, for instance, aims for chargers to be within a five-minute walk, yet current networks often require much longer travel times.

Technical and operational feasibility

There are many enablers of shared domestic charging in terms of technical aspects. Such models rely on existing household electricity connections, meaning they avoid the need for extensive infrastructure works, keeping costs and disruption low. Smart chargers add further capability by enabling load management, access control, and scheduled charging, allowing hosts to manage demand and usage. These systems naturally align with overnight charging patterns that flatten peak loads on the grid, though shifting user behaviour, such as declining reliance on overnight sessions within the Co-Charger model, suggests that perceptions of reliability and convenience can evolve over time.

However, important limitations remain. Most domestic chargers offer lower power and longer charge times than public rapid chargers, making them less suitable for certain user groups or urgent charging needs. Capacity constraints within homes, particularly older properties with limited single-phase (rather than three-phase) electrical systems, can further reduce suitability. Interoperability challenges between different charger brands and platforms also persist, creating friction for both hosts and chargees. As seen in the Co-Charger ecosystem, charging hardware and platform compatibility is not yet seamless, which complicates scale-up and limits user flexibility.

Governance, legal, and regulatory frameworks

Partnerships between local authorities and charging platforms are emerging as a key enabler of shared domestic charging. Some operators see particular potential in models where councils actively stimulate uptake through targeted grants. For example, Co-Charger has suggested a local-authority-led shared charging grant scheme, in which small financial incentives are offered to early adopters who begin sharing their chargers. Other providers, such as Trojan, emphasise instead the importance of councils being willing to approve and deploy solutions at scale. In London, where Trojan Home has expanded rapidly, council willingness to facilitate and approve installations has been a critical factor in accelerating uptake.

However, regulatory and legal uncertainty remains a significant barrier. Liability and insurance responsibilities between hosts, users, and platforms are not always clear, and restrictions on cables crossing public highways or pavements complicate installation in densely populated areas. Although Trojan Home systems no longer require planning permission following recent regulatory changes, including the removal of Section 50 requirements, local authorities often impose additional checks or paperwork due to risk aversion. This inconsistency creates uncertainty for providers and slows deployment, especially where councils lack clear guidance or precedent.

Digital systems, data, and payments

Digital systems play a critical enabling role in shared domestic charging by facilitating transactions and generating consistent, granular data that can inform planning and policy decisions. Platform-level metrics, such as utilisation rates, repeat usage, and host–

chargee retention, make it possible to assess how shared charging operates in practice and where it is delivering the greatest value for users and hosts.

For example, Co-Charger tracks “stickiness,” measuring the frequency with which hosts and chargees return for repeated sessions. This metric provides an indicator of behavioural change and charging reliability, which can be translated into estimates of reduced vehicle miles travelled, and lower reliance on public networks. Where shared with local authorities, such data has the potential to support evidence-based decisions on where shared domestic charging is most effective, how it complements on-street provision, and whether it warrants targeted policy support or funding.

However, digital fragmentation remains a substantial hurdle. The proliferation of different apps and platforms reduces visibility and consistency for users, who may struggle to navigate an increasingly complex ecosystem. Digital exclusion also poses risks: residents without smartphones, bank accounts, or reliable connectivity may be unable to participate. Constraints around data-sharing, especially with local authorities, add further complexity, limiting opportunities to use insights for planning, network management, or identifying local charging gaps.

Case study: Trojan Home

Trojan Home is a shared domestic charging solution developed by Trojan Energy that enables residents without private driveways to access low-cost, home-connected EV charging directly on their street. It bridges the “driveway divide” by extending the benefits of domestic electricity tariffs to on-street charging and can be used by multiple drivers in a neighbourhood.

Figure 3.6: Trojan Home chargers

The chargers are designed for sharing, with flat, pavement-level units that minimise street clutter. Hosts can use the charger themselves and make it available to neighbours on a pay-as-you-go basis, receiving reimbursement for electricity consumed by others. Chargers are smart-enabled to support load management and overnight scheduling, and a monthly subscription covers installation, maintenance, and network access.

Engagement with Kent County Council (KCC) indicates that the council has already delivered 10 Trojan Home installations as part of its pilot programme, with a further 40 planned and potential for additional expansion. KCC described the product as enabling access to home-tariff charging through a subscription model and has performed well on simultaneous-touch electrical safety considerations. The concept is considered as semi-public sharing, supporting a small cluster of nearby households rather than competing directly with the public LEVI network.

3.4 Shared depot charging

Shared depot charging is increasingly being explored as a practical way to expand charging capacity by making better use of existing fleet sites, particularly in dense urban areas where space and on-street provision are constrained. Early pilots show growing interest, and the potential role of digital tools in enabling shared access.

Paua’s shared depot service (“Paua Share”) provides a managed model that connects fleet operators with under-utilised chargers at secure, semi-private sites such as bus and logistics depots through a digital matchmaking and access platform. Depot owners retain control over access rules, operating hours and vehicle compatibility, while Paua manages contracts, authentication, billing and fleet-level reporting through a single interface.

By opening up high-capacity depot infrastructure, including sites equipped with rapid and ultra-rapid chargers, the model helps address one of the key barriers to commercial fleet electrification: reliable access to suitable charging where dedicated depots are unavailable or insufficient. This approach improves asset utilisation, reduces reliance on constrained public charging networks, and provides fleets with greater operational flexibility while maintaining site security and operational integrity.

However, significant obstacles to wider adoption remain. Many depots face acute space and security limitations, data-sharing processes are complex, and operational cultures are often resistant to external users. Policy uncertainty and market volatility further complicate long-term planning, making it essential to understand the conditions under which shared depot charging can genuinely relieve pressure on public and on-street networks.

3.4.1 Enablers and barriers to shared depot charging

Planning and site constraints

Interest in shared depot charging is growing, particularly in London, where space, infrastructure, and cost pressures are most acute. Public sector bodies such as local councils, which often operate in highly constrained urban locations, see shared use as a potential way to alleviate these challenges. Several stakeholders are already piloting or exploring pilot arrangements, demonstrating a willingness to collaborate where regulatory or operational issues can be resolved.

However, depot space remains a significant limiting factor. Many existing sites can barely accommodate their own fleets, with double-parking and restricted layouts already common. Furthermore, in some cases, introducing additional vehicles may require planning permission for upgrades or changes to site use.

Beyond these physical constraints, legal, security, health and safety and insurance requirements add further complexity. Organisations are often deterred by the need to establish clear liability between partners, manage third-party access, and maintain operational safety in environments not designed for shared use.

Safety and security

There is some precedent for secure collaboration among emergency services. Islington, for example, has successfully shared depot space with the Metropolitan Police, showing that with appropriate agreements, shared access is possible.

Nonetheless, security concerns remain one of the most significant barriers. This is especially the case for depots that store high-value equipment or sensitive operations. Allowing external users onsite introduces risks related to theft, vandalism, and general site safety. Overnight operations and the need for tightly controlled perimeters make many public sector fleets particularly reluctant to open their sites to others.

Some organisations, such as First Bus, have three different types of depot models:

- **Inside the fence** – located within the physical boundary and infrastructure is typically used by those who have been given permission.

- **Flex the fence** – made available to third parties or partner fleets, especially outside peak usage times e.g. through temporary fencing.
- **Outside the fence** – charging infrastructure is positioned outside an operator's depot boundary, including public charging hubs, shared-use depots, or en-route charging sites open to multiple users and operators.

Metering, billing, and data

Digital tools used in some early pilots, such as booking platforms and RFID-based access controls, show promise in enabling shared charging infrastructure within private depots. These solutions could support accurate metering and billing, potentially allowing hosts to offer discounted rates to partner organisations and share costs.

Despite this, charging other organisations remains operationally complicated. Metering and reconciling energy use across different entities can be difficult, and invoicing processes may be cumbersome. Data sharing adds further friction: organisations must exchange usage, billing, and operational information, which is challenging where particular cybersecurity concerns exist, such as is the case for fleet operators like the Police. The absence of standardised systems for access control, metering, and data exchange makes scale-up even more complex.

Operational and cultural factors

Some organisations are open to hosting external users, particularly when shared charging can help offset infrastructure costs or support broader electrification ambitions. There is also growing recognition that enabling depot and workplace charging could ease demand on constrained public and on-street networks.

However, operational culture remains a major barrier. Several stakeholders expressed discomfort with the idea of external vehicles or drivers entering their depots, fearing disruption, reduced operational control, or unintended inefficiencies. For many, these cultural and operational hesitations weigh just as heavily as technical or regulatory ones.

Competitive dynamics between organisations add another layer of complexity. In sectors where shared depot charging could deliver the greatest benefits, such as road haulage, operators are often direct commercial rivals. This makes collaboration difficult, as organisations fear losing competitive advantage or revealing commercially sensitive operational patterns and practices.

Related to this is the differing motivation between local authorities and private operators when acting as infrastructure hosts. Local authorities are typically driven by public value, emissions reduction, and broader social outcomes, which can translate into lower margins and greater openness to shared use. In contrast, private operators are generally more commercially focused, with revenue generation and return on investment shaping their willingness to share facilities. These misaligned incentives can hinder the development of such shared charging arrangements.

Policy and market instability

Policy support, such as grants, guidance, or regulatory incentives, could help unlock shared charging models. In particular, grant programmes that encourage collaboration, such as funding bids structured around consortia (made up of CPOs, OEMs, operators, SMEs, for example), can provide a formal mechanism for cooperation, knowledge-sharing, and relationship-building. While these early collaborations often remain limited to familiar or trusted partners rather than encouraging fully open sharing, they still represent a meaningful first step in reducing barriers and fostering wider engagement over time.

Despite these potential benefits, policy uncertainty remains a significant challenge. Organisations are often unsure about the long-term expectations or rules around shared infrastructure, for example, whether a depot host that initially installed chargers with grant funding is permitted to profit from offering shared access. Such questions remain unresolved within current Department for Transport (DfT) guidance, creating hesitation around investment and shared-use agreements.

These policy ambiguities interact with wider market instability. With technology standards evolving rapidly and suppliers sometimes exiting the market, organisations face difficulties making long-term planning and investment decisions. Public sector procurement cycles, which are typically lengthy and inflexible, further compound these risks by limiting the ability to respond to new opportunities or adapt to changing conditions.

3.4.2 Key findings

Shared depot charging is widely acknowledged as a promising way to reduce pressure on on-street charging infrastructure. Early pilot projects and a general willingness among some organisations to collaborate highlight the potential of this approach. Emerging digital tools for booking, metering, and access control also provide important enablers.

However, significant barriers remain. Space limitations, safety and security concerns, complex billing and data management processes, and entrenched operational cultures all hinder progress. Unlocking the full potential of shared charging will require coordinated policy intervention and greater standardisation in planning processes, safety requirements, metering systems, and data exchange protocols.

Case study: First Bus launch of "First Charge"

In July 2025, First Bus launched First Charge, a shared depot charging initiative that opens 15 depots across Scotland and England for use by businesses and fleet operators, and, in Glasgow, by the wider public.

Figure 3.7: First Charge superhub

Source: Electrical Times

Figure 3.8: Calibre D2D

Source: First Charge

The Caledonia depot in Glasgow is the flagship First Charge site. During off-peak bus operating hours, the depot functions as a public-facing, ultra-rapid charging hub with capacity to charge up to 34 fleet and consumer vehicles simultaneously. Charging is available between 09:00 and 16:30, when buses are in service, at an introductory tariff of £0.39/kWh. Access is enabled through multiple payment options, including contactless payment and roaming cards and apps such as Fuuse, Paua, Electroverse and Allstar, reducing barriers for both fleet and individual users.

Calibre, a logistics operator, provides an example of how First Charge operates as shared depot infrastructure for commercial fleets. Calibre has used the network to charge over 300 vehicles across 14 First Bus depot sites, consuming approximately 72 MWh of renewable electricity.

Reported benefits include improved operational efficiency through access to high-capacity depots capable of charging multiple vehicles simultaneously, simpler back-office processes enabled by consolidated billing and single-network access, and lower carbon emissions through the use of renewable electricity and the avoidance of diesel-powered vehicle transport.

3.5 Complementary solutions, technologies, and governance models

3.5.1 Complementary solutions

Overview

As the UK's EV charging ecosystem matures, it is increasingly clear that no single delivery model can meet the full diversity of user needs.

Complementary charging solutions, situated at the intersection of on-street and off-street provision, represent the *next stage* of EV infrastructure development, offering scalable, cost-effective options that extend accessibility while balancing local space, grid and social constraints.

The following solutions can be applied to allow local authorities to make better use of existing land assets, reduce visual and operational pressure on streets, and support a broader range of vehicles, from private cars and car clubs to vans and HGVs.

This section outlines seven principal types of complementary charging infrastructure emerging across the UK. Each is described in terms of function, user segments, indicative power, land types, delivery models, and practical examples. The approaches outlined below are designed to respond to specific local contexts and user needs. They can be deployed individually or in combination as part of a mixed-network approach.

Commercial and mixed-use charging hubs

Description

Commercial and mixed-use hubs are large, multi-bay charging facilities located on retail, industrial, or business park premises. They serve both public and fleet users, typically combining short-stay rapid charging for users with longer dwell opportunities for employees or overnight fleet charging.

Where deployed, they are usually equipped with rapid or ultra-rapid chargers (50–350 kW) at locations that already attract regular vehicle dwell time, such as supermarkets, retail parks, leisure centres, and service areas.

Key features

- High-capacity power connections or private grid reinforcement
- Opportunity for solar canopy integration and behind-the-meter storage
- Amenities that enhance site attractiveness (Wi-Fi, café, washroom facilities)
- Co-location with other complementary services such as shared micromobility and parcel lockers.

Role and benefits

These hubs are particularly effective in areas where residential on-street charging is limited but commercial land is available. They can support:

- Overnight charging for local residents and tradespeople.
- Daytime charging for fleets, service vehicles, and delivery drivers.
- Grid-balancing through smart energy systems, solar generation, and storage.

Delivery and business models

Delivery models vary: some hubs are delivered through landlord–tenant arrangements, others via public–private joint ventures or CPO-led concessions. Revenue streams can include:

- Land lease or concession models between landowners and CPOs
- Shared revenue or anchor-tenant arrangements with fleets or retail partners
- Potential integration with private wire energy supply or community energy schemes.

Case study example

Oxford Energy Superhub demonstrates this concept at scale. It combines 42 ultra-rapid chargers, onsite battery storage, and renewable generation. Its governance model, combining the City Council, EDF Renewables, and Pivot Power, illustrates how complementary commercial partnerships can work effectively under a shared decarbonisation objective. EV hubs as catalysts for economic renewal.

Park-and-charge concepts

Description

Park-and-charge schemes adapt existing public or private car parks, transport interchanges, and park-and-ride facilities to provide EV charging, typically at standard (7–22 kW) speeds. Such sites often offer smart access and payment systems, typically via mobile apps or RFID cards, and are integrated with parking management systems and existing tariffs.

Furthermore, they offer the opportunity for renewable energy generation integration or managed charging for grid balancing. These are particularly effective for residents without home charging, commuters, and small fleets operating in urban and peri-urban areas.

This model often represents the lowest-cost and most scalable near-term solution for local authorities, making use of public land and existing power connections.

Role and benefits

Park-and-charge concepts offer multiple benefits, including:

- Utilise underused parking capacity, especially overnight.
- Offer scalable, grid-efficient solutions with minimal disruption to parking.
- Support integration with active travel and public transport by placing charging at key modal interchanges.

Delivery and business models

Most park-and-charge projects are delivered under CPO concession models with local authority land leases. In some cases, councils retain ownership of the chargers and contract operators for maintenance. Tariff income can offset energy costs or alternatively contribute to local energy schemes.

- Local authority-owned and operated under LEVI funding
- CPO concession models with performance-based revenue sharing
- Hybrid models combining resident permits with public pay-as-you-go access.

Case study example
Kent County Council's Park & Charge network has demonstrated how underused car parks can be transformed into accessible, low-cost charging hubs for residents, using smart load management to make best use of limited grid capacity.

The *Oxford Park & Charge* pilot (2021–23) demonstrated that overnight residential charging demand can be met effectively through council car parks, with utilisation averaging 40–60% during off-peak hours. Similar models are now being adopted across county authorities, including Kent, Oxfordshire, and Dorset, as part of LEVI delivery strategies.

Mobility and transport hubs

Description
These are integrated sites combining EV charging with shared mobility options, such as EV car clubs, e-cargo bikes, and public transport services, within a single, well-designed space. They are increasingly viewed as key nodes in multi-modal networks that support behaviour change and reduce car dependency.

Whilst the charging infrastructure is dedicated to the EV car clubs vehicle and therefore not directly available to owners of private cars, car clubs provide convenient alternative for people who only need access to a (second) car occasionally. This helps to reduce rates of car ownership, and therefore pressure on on-street charging infrastructure.

Role and benefits

- Enable seamless interchange between shared mobility services (including car clubs) and public and active modes of transport.
- Provides visible community anchors for accessing shared zero-emission transport.
- Improve land-use efficiency by clustering modes and reducing car ownership.

Delivery and business models
EV car clubs at mobility hubs Typically delivered via local authority-led partnerships, often supported by developer contributions, or mobility-as-a-service (MaaS) operators. Funding can be provided through Section 106 agreements, public land leases, or innovation funding (e.g. DfT Future Transport Zones).

Case study example
Opened in 2025, the mobility hub at *Plymouth Coach Station* brings together a powerful mix of transport options in one convenient location including a fleet of e-bikes, an electric car club vehicle, Rapid EV charging stations, a real-time bus stop; proximity to the city's coach station (just 50 metres away); and walking and cycling infrastructure. Located next to Plymouth Central Library, the hub also offers easy access to public toilets, tourist information, cafés, shops, and other city centre amenities, making it a natural gateway for both locals and visitors.

Shared residential and fleet charging zones

Description
In mixed-use or high-density areas, shared charging zones can serve both residents and local SMEs, such as maintenance contractors, delivery firms, or taxi drivers. Located on public or semi-private land (e.g. depots, industrial estates, or community facilities), they

allow time-scheduled or subscription-based access for vehicles that are parked for predictable periods.

Role and benefits

- Reduces duplication of infrastructure across small business and household use.
- Supports electrification of light commercial vehicles without full depot access.
- Enables dynamic pricing and load management across user groups.
- Combination of AC and DC chargers depending on fleet mix
- Potential for smart load balancing and energy trading between users
- Often paired with solar PV and on-site storage to optimise energy costs

Delivery and business models

Can be delivered under cooperative ownership models or community subscription schemes where usage rights are shared. In some cases, local authorities act as data platform owners while CPOs manage hardware and payments.

- Co-investment or anchor-tenant model (e.g. a fleet operator underwriting site utilisation)
- Community interest company (CIC) or cooperative models for neighbourhood deployment
- Long-term lease or revenue-sharing agreements with the local authority.

Case study examples

Nottingham's Community Charging Zones demonstrate shared access for residents and small commercial operators, with flexible tariffs and managed access via digital booking platforms.

The *Shared Access EV Charging Pilot* in Dundee successfully integrated residential and fleet use through managed scheduling software, achieving higher asset utilisation rates and demonstrating the potential for cross-sector partnerships in constrained urban settings.

Electric freight and servicing micro-hubs

Description

Micro-hubs are compact sites supporting last-mile delivery, e-cargo bikes, trades, or service fleets. They may combine charging with parcel storage, micro-logistics operations, and sometimes small-scale renewable generation.

Role and benefits

- Reduces the need for freight vehicles to travel long distances for charging.
- Supports urban logistics decarbonisation and ZEFZ (Zero Emission Freight Zone) objectives.
- Enables shared use between logistics operators, local businesses, and council fleets.
- Sites typically 500–2,000 m^2, located on industrial or local authority land
- Mix of rapid (50–150kW) and depot-style slow charging for different vehicle profiles
- Integration with cargo-bike logistics, shared micro-mobility, or consolidated delivery services

- Opportunities to repurpose underused land or redundant car parks

Delivery and business models
Micro-hubs are often developed through public–private logistics partnerships or developer-led schemes within new industrial or regeneration areas. Such sites may be co-funded via freight innovation or LEVI+ demonstration programmes. Typical delivery models include:

- Public–private joint ventures with logistics operators or property developers.
- Anchor-tenancy by courier or fleet companies guaranteeing base demand.
- Inclusion within city freight consolidation strategies and zero-emission freight zone pilots.

Case study examples
The West Midlands Freight Innovation Hub integrates rapid charging with shared loading bays and data-driven access scheduling. The model highlights the value of shared micro-hub infrastructure in managing urban logistics emissions.

In London, *Westminster City Council's Micro Logistics Hub* (operated with Cross River Partnership) demonstrated up to 70% reduction in van trips and a 35% improvement in last-mile efficiency, supported by shared access charging infrastructure and flexible site use.

Community-led and parish-level solutions

Description
At the community level, small-scale, locally governed charging schemes delivered by community energy groups, parish councils, or local trusts are emerging in rural and semi-rural areas where commercial CPO interest is limited. These typically comprise of small-scale installations, typically 2–6 chargers, delivered using grant funding or cooperative ownership.

Role and benefits

- Builds local ownership and trust.
- Keeps revenue within the community through reinvestment in local energy or social projects.
- Can be combined with solar PV or microgrid systems to improve rural energy resilience.
- Can make use of existing community land, village halls, or local authority car parks.
- Engagement-led design to ensure visibility, accessibility, and local ownership.
- Integration with solar PV, battery storage, or time-of-use pricing.
- Often linked to wider rural mobility or shared transport schemes.

Delivery and business models
Typical models include community benefit societies or parish-led leases supported by grant funding and local investment. Ongoing management may be provided by regional energy cooperatives.

- Grant-funded community ownership with local tariff setting.
- Leasing to CPOs under simplified concession agreements.
- Revenue reinvestment into local sustainability projects.

Case study examples
Northumberland Community Charging Project uses parish-level governance to manage chargers across rural villages, funded through a mix of community shares and LEVI support.

Boscastle's EV charging infrastructure is owned and operated by Boscastle Community Interest Company (CIC), rather than a commercial charge point operator or local authority. It represents a locally managed, community-led charging model designed to serve both residents and visitors in a remote rural location.

The *Charge My Street* programme has delivered over 100 community-owned charge points in the North West and Cumbria, demonstrating that local governance can be a powerful enabler of equitable EV access in low-demand areas.

Adaptive / pop-up trials

Description
Flexible, modular charging units are being integrated into adaptable public realm designs, often used for temporary installations, trials, or event-based activation. Typical hardware types include retractable chargers, micro-bollards, and wireless pads.

Role and benefits

- Enables data collection and resident engagement before permanent deployment.
- Minimises visual impact in sensitive areas or conservation zones.
- Supports dynamic kerbside management aligned with changing mobility needs.

Delivery and business models
Generally trialled under innovation partnerships or DfT-funded pilots, with temporary permissions and evaluation frameworks built in.

Case study example
Westminster City Council's Pop-Up Charging Pilot tested retractable kerbside chargers to evaluate user satisfaction, accessibility, and maintenance requirements before wider rollout.

Emerging solutions matrix

Table 3.5 below summarises the emerging solutions covered in this section and details the typical attributes of each across their respective user groups, power levels, place types, and delivery models.

Table 3.5: Emerging solutions matrix

Typology	Typical Users	Indicative Power	Land Type	Delivery Model	Core Benefits
Commercial & Mixed-Use Hubs	Residents, fleets, public	50–350 kW	Retail / industrial	JV / concession	Economic regeneration, high visibility
Park-and-Charge	Residents, commuters	7–22 kW	Car parks / interchanges	Concession	Affordable, scalable, uses existing assets
Mobility Hubs	Car clubs	22–150 kW	Urban centres	LA–developer partnership	Dedicated provision to support shared mobility
Shared Residential/Fleet Zones	Residents, SMEs	7–50 kW	Public or mixed	Cooperative / subscription	High utilisation, flexible models
Freight Micro-Hubs	Logistics, SMEs	150–350 kW	Industrial / edge-of-town	PPP / developer-led	Reduces city centre van trips
Community-Led Solutions	Rural residents	7–22 kW	Parish / community land	Community energy	Builds trust and rural access
Adaptive / Pop-Up Trials	Residents, visitors	Variable	Public realm	Innovation pilot	Rapid innovation

3.5.2 Emerging technologies and integration opportunities

As EV charging networks scale, attention is shifting from simple infrastructure provision to system optimisation and integration. Emerging technologies now enable charging assets to operate not as isolated installations, but as active components within wider energy, mobility and digital ecosystems. For LTAs, this presents an opportunity to reduce deployment costs, manage grid constraints, improve user experience and unlock additional value streams.

Many of the technologies outlined below are already commercially available, with varying levels of maturity, and can be incorporated into complementary charging solutions today. When deployed alongside other interventions, they support a transition from static infrastructure delivery to a more flexible, data-driven and integrated model of local energy and mobility provision.

Smart charging and load management

Overview
Smart charging enables charge points to adjust power output dynamically in response to user demand, grid conditions, or price signals. For local authorities, this technology allows a greater number of charge points to be installed within existing network constraints while reducing reinforcement costs.

Applications in complementary solutions

- *Park-and-Charge sites* can use dynamic load balancing to manage peak demand across multiple bays.
- *Shared residential and fleet zones* can optimise overnight charging schedules for mixed users, prioritising essential vehicles.
- *Freight micro-hubs* can use time-of-day tariffs to incentivise off-peak charging.

Delivery considerations
Local authorities should specify compliance with Open Charge Point Protocol (OCPP) and Open Smart Charging Protocol (OSCP) standards to ensure interoperability and flexibility for future upgrades. Collaboration with Distribution Network Operators (DNOs) is essential to align smart charging with local grid management objectives.

Battery energy storage systems (BESS)

Overview
Battery storage allows charge points or hubs to draw energy during periods when it is relatively low-cost and low-carbon and discharge it when demand peaks. For sites with limited grid capacity, storage can also enable the installation of higher-powered chargers without full connection upgrades.

Applications in complementary solutions

- *Commercial hubs* can pair storage with solar generation to reduce peak import charges.
- *Community-led schemes* can use smaller BESS units to stabilise supply and participate in local energy markets.
- *Fleet depots or shared zones* can use storage for load-shifting and resilience.

Benefits

- Lower grid connection costs and faster deployment
- Increased renewable energy utilisation
- Potential participation in flexibility and balancing services markets

Case study example
Connected Energy's E-STOR system, which uses second-life EV batteries for grid-connected charging hubs, has been deployed by local authorities and CPOs to reduce connection times and operational costs.

Renewable generation and local energy integration

Overview
Integrating renewable generation, most commonly solar PV, into charging infrastructure can reduce operational emissions, hedge against energy price volatility, and support place-based sustainability objectives.

Applications in complementary solutions

- Solar canopies at *Park-and-charge* sites or *commercial hubs* can directly power charge points or feed into on-site storage.
- *Community-led schemes* can link with local energy cooperatives or parish-level solar arrays to create circular energy economies.
- *Micro-hubs* can integrate with district energy or local microgrids to serve multiple mobility and logistics functions.

Delivery Considerations
While on-site generation reduces operational carbon, planning, grid export constraints, and roof orientation must be carefully assessed. Where direct PV integration is not viable, authorities may consider Power Purchase Agreements (PPAs) to supply charging sites with certified renewable energy.

Case study example

Stourton Park & Ride on the outskirts of Leeds is the UK's first fully solar-powered park-and-ride, featuring solar carports, battery storage, and electric vehicle charging stations. The project showcases how renewable energy can be integrated into public transport infrastructure, reducing reliance on the grid and promoting sustainable travel through modal shift.

Digital platforms and data interoperability

Overview
Digital platforms can be leveraged to underpin efficient operation and a high-quality user experience by providing real-time visibility of utilisation, maintenance status, and displaying pricing information. Interoperability and open data standards are critical to ensure network reliability and future integration with additional partners and Mobility-as-a-Service (MaaS) systems.

Applications in Complementary Solutions

- *Shared fleet/residential zones* can use digital scheduling tools to manage user bookings and access control.
- *Community charging models* benefit from data on usage and revenue distribution.
- *Commercial hubs* can integrate with logistics software to plan fleet charging dynamically.

Future direction
AI-based predictive analytics will enable proactive maintenance, optimal pricing strategies, and demand forecasting, helping LTAs to plan expansion based on data-driven insights rather than reactive user feedback.

Best practice frameworks

- *Open Charge Point Interface* (OCPI) for roaming and tariff transparency.
- *DfT's National Charge point Registry* (NCR) compliance for all public installations.
- *LAEP+ integration* for linking transport demand and energy data.

Vehicle-to-grid, Vehicle-to-Everything, and bi-directional charging

Overview
Bi-directional charging allows EVs to discharge energy back to the grid or local buildings, transforming vehicles into distributed energy assets. While still at early commercial stages, V2G and V2X are gaining attention as fleets electrify and battery costs fall.

For an EV owner, this means the vehicle can export stored energy back to the home, a building, or the wider grid. In practice, a driver plugs in as normal, but a smart charger and energy tariff manage the flow automatically, exporting energy when grid electricity is most expensive and recharging when it is cheapest. For most drivers, this would be largely invisible, managed in the background around their schedule to ensure the vehicle charged when they need it.

V2G refers specifically to export back to the public electricity network; V2X is broader, covering vehicle-to-home (V2H), vehicle-to-building (V2B), and vehicle-to-load (V2L) applications where energy is used locally.

Applications in complementary solutions

- *Shared fleet charging zones* could provide flexibility services to DNOs.
- *Community charging sites* could support resilience in rural areas or critical facilities.
- *Park-and-charge* schemes may pilot V2G with residential users through aggregated services.

Challenges

- Standardisation (CHAdeMO vs. ISO 15118) and hardware availability remain barriers.
- Business models depend on energy market access and aggregation frameworks.
- Long-term battery health impacts must be closely monitored.

Case study example
The *Electric Nation V2G* project demonstrated how domestic and fleet users could provide grid services without compromising mobility needs, offering a blueprint for future integration in local networks.

Integration with broader mobility and energy systems

Overview
Complementary charging infrastructure will increasingly be embedded within a wider energy-mobility ecosystem, integrating transport, property, and utility functions.

Integration opportunities

- *Multi-modal hubs* combining EV charging, e-bike/scooter hire, and public transport access.
- *Smart city data platforms* linking EV charging demand with air quality, parking, and traffic management systems.
- *Energy system coordination* through LAEPs, ensuring charging rollout aligns with renewable generation and flexibility markets.

Strategic value
Integrating complementary charging with other public realm and infrastructure

investments enables co-benefits such as improved air quality, digital inclusion, and local regeneration, while maximising return on public funds.

Summary of emerging integration opportunities

Table 3.6: Summary of emerging integration opportunities

Technology	Application Area	Benefit	Maturity Level (2025)
Smart Charging	All typologies	Grid efficiency, cost savings	High
Battery Storage	Hubs, fleet zones	Grid resilience, cost control	Medium
Solar Integration	Hubs, community sites	Low-carbon energy, visibility	High
Digital Platforms	Shared, park-and-charge	Transparency, data optimisation	High
V2G / Bi-Directional	Fleet, community	Grid flexibility, resilience	Low–Medium
Mobility & Energy Integration	Hubs, LAEPs	System-level benefits	Medium

3.5.3 Emerging business and governance models

Delivering complementary EV charging solutions requires local authorities to navigate a complex mix of funding, ownership, and operational arrangements. Emerging business models balance risk, revenue, and control, enabling LTAs to expand access while minimising capital outlay and ensuring long-term sustainability.

This section outlines the key models, practical considerations, and UK-based examples.

Public ownership with managed operations

Description
Under this model, the local authority retains ownership of the charge points and associated land, while contracting a Charge Point Operator (CPO) to manage installation, maintenance, and customer access.

Advantages

- Maximum local control over siting, pricing, and accessibility
- Simplified integration with planning and transport strategy
- Transparent reporting and accountability

Challenges

- Requires upfront capital investment from the council or grant funding
- Long-term operational management remains the council’s responsibility
- May be less commercially attractive to private partners without guaranteed revenue

Case study example
Oxford City Council Park & Charge sites are operated under council ownership, with contracted CPOs providing day-to-day maintenance and billing services.

Concession and revenue-sharing models

Description
A concession arrangement allows a private operator to finance, install, and operate charging infrastructure for a fixed period, often 10–15 years, in exchange for a share of revenues. The local authority typically retains ownership of the land and oversees compliance with access, pricing, and service standards.

Advantages

- Shifts capital and operational risk to the private partner
- Leverages commercial expertise for site management and technology upgrades
- Potential for innovation in tariff structures, digital platforms, and ancillary services

Challenges

- Revenue is shared, so the council may earn less than under direct operation
- Long-term flexibility is reduced; renegotiation of terms may be required for technology upgrades
- Requires robust legal and commercial frameworks to protect public interest

Case study example
West Midlands Combined Authority has used concession models for park-and-charge and mobility hubs, with private operators responsible for installation, maintenance, and user billing.

Anchor-tenant and co-investment models

Description
Anchor-tenant models rely on a primary user (often a fleet operator or commercial tenant) to underwrite demand and capital costs, while other users can access the same infrastructure under secondary agreements. Co-investment approaches can combine public funds, private investment, and developer contributions.

Advantages

- Reduces risk for public sector partners by guaranteeing minimum utilisation
- Encourages private-sector participation in under-served areas
- Can accelerate deployment in commercial or mixed-use sites

Challenges

- Requires careful negotiation to balance competing user needs
- Tariff structures must be transparent to avoid cross-subsidisation disputes
- Contracts must anticipate potential changes in the anchor tenant’s fleet or operations

Case study example
The *Oxford Energy Superhub* combines anchor-tenancy from fleet operators with public access for residents and visitors, generating a diversified revenue stream while reducing reliance on subsidies.

Community-led and cooperative ownership models

Description
Community-led models are typically suitable for rural, semi-urban, or low-demand areas where commercial operators are unwilling to invest. Local groups, parish councils, or cooperatives own and operate charging infrastructure, often leveraging grant funding and volunteer management.

Advantages

- Builds trust, local engagement, and social licence
- Keeps revenue within the community for reinvestment in local sustainability projects
- Can target equity and accessibility objectives effectively

Challenges

- Scale is limited; site density may be low
- Professional operations, maintenance, and billing services may still require external contractors
- Funding cycles can be short-term, requiring ongoing grant or subsidy support

Case study example
The *Northumberland Community Charging Project* demonstrates how cooperative models can provide equitable EV access in rural areas using LEVI and local funding.

Hybrid and innovation partnership models

Description
Hybrid models combine elements of public ownership, concession, anchor-tenant, and co-investment approaches. They are often used in *pilot projects, mobility hubs, and regeneration schemes*, where risk, revenue, and control are shared.

Advantages

- Flexibility to adapt to local context, grid capacity, and user mix
- Encourages innovation in technology integration, tariffs, and services
- Can unlock funding from multiple sources, including LEVI, developer contributions, and private capital

Challenges

- Governance and contractual arrangements are complex
- Requires high-quality project management and stakeholder coordination
- Success depends on early clarity on responsibilities, risk allocation, and long-term objectives

Case study example
Coventry Mobility Hub pilot combined local authority funding, developer contributions, and private-sector CPO operation. The arrangement allowed the hub to support fleet, public, and shared mobility users while integrating smart charging and digital access platforms.

Summary

Table 3.7 below summarises the governance models presented in this section.

Table 3.7: Summary of governance models

Model	Description	Advantages	Challenges	Example
Public Ownership	Council owns, contracts CPO	Maximum control	Capital cost, operational responsibility	Oxford Park & Charge
Concession / Revenue-Sharing	Private operator invests & operates	Shifts risk, drives expertise	Revenue sharing, long-term flexibility	West Midlands Park & Charge
Anchor-Tenant / Co-Investment	Primary tenant underwrites demand	Reduced risk, faster deployment	Contract complexity, balancing needs	Oxford Energy Superhub
Community / Cooperative	Local group owns & operates	Builds local trust, keeps revenue local	Limited scale, professional operations	Northumberland Community Charging
Hybrid / Innovation Partnership	Mix of above, multi-stakeholder	Flexible, encourages innovation	Complex governance	Coventry Mobility Hub

3.5.4 Evaluation framework and decision pathways

The deployment of complementary EV charging solutions involves balancing multiple, sometimes competing, factors including user demand, operational feasibility, grid capacity, cost, and community benefit. A structured evaluation framework helps local authorities make evidence-based decisions, prioritise sites and typologies, and sequence investments for maximum impact.

This section sets out a practical approach to evaluating complementary solutions, supported by decision matrices and indicative performance criteria.

Core evaluation criteria

Provides an evaluation matrix for comparing typologies based on land use, energy availability, user need, and deliverability. A robust evaluation framework considers the following key dimensions in the table below.

Table 3.8: Core evaluation criteria

#	Evaluation criteria	Aspects to be assessed
1	Demand and user needs	• Existing EV ownership and projected growth • Residential access constraints (e.g., street parking availability) • Local business and fleet requirements, including freight and service vehicles
2	Operational feasibility	• Site accessibility, vehicle manoeuvrability, and safety • Planning and permitting constraints • Maintenance and operational access
3	Energy and grid considerations	• Local network capacity and reinforcement requirements • Potential for renewable generation or energy storage • Integration with smart charging and future upgrades
4	Financial viability and funding	• Capital and operational costs • Revenue potential and cost recovery (tariffs, partnerships, grants) • Co-investment or concession arrangements
5	Community and environmental impact	• Visual and streetscape integration • Air quality and noise benefits • Equity of access for low-income and mobility-restricted users
6	Strategic alignment	• Alignment with Local Transport Plan (LTP) objectives • Contribution to LEVI delivery or other national funding targets • Support for decarbonisation, mode shift, and local energy planning

Decision pathway for typology selection

The decision pathway below provides an ordered approach for selecting the most appropriate complementary solution for each site or area.

1. **Map potential sites** – Identify all candidate locations, including public land, private partnerships, and underused parking facilities.
2. **Screen against feasibility** – Assess site access, planning constraints, grid capacity, and safety considerations.
3. **Analyse demand** – Evaluate usage by residents, fleets, and commercial operators.
4. **Match typology to context** – Align each site with the typology most suited to its demand profile, land characteristics, and operational requirements (see Section 3).
5. **Evaluate business model options** – Determine the most appropriate governance, funding, and operational model (see Section 5).
6. **Prioritise based on multi-criteria scoring** – Score sites against demand, feasibility, cost, and strategic alignment to rank investment and deployment sequence.
7. **Plan for pilot or phased rollout** – Select early-stage pilots to test assumptions, gather data, and refine models before wider deployment.

Furthermore, the roadmap on the next page (Table 3.9) sets out a more detailed approach to defining and scaling pilots once an intervention has been selected.

Table 3.9: Roadmap and phasing

Phase	Timescales	Objectives	Key activities	Expected outcomes
Phase 1: Preparation and Early Pilots	0–12 Months	• Establish governance structures and stakeholder engagement • Identify candidate sites for pilot deployment • Define monitoring, evaluation, and reporting frameworks	1. **Stakeholder Engagement:** Bring together LA departments, CPOs, DNOs, fleet operators, and community groups. 2. **Site Identification:** Map potential locations for park-and-charge, shared zones, and micro-hubs. 3. **Pilot Design:** Select 2–5 pilot sites representing a mix of urban, suburban, and rural contexts. 4. **Technology Integration:** Deploy smart chargers, digital management platforms, and optional renewable generation or storage solutions. 5. **Funding Alignment:** Secure early-stage funding via LEVI, local authority budgets, or innovation grants.	• Verified assumptions on demand, utilisation, and operational feasibility • Initial evidence base for typology suitability and business model effectiveness • Refined site selection criteria and multi-criteria scoring methodology.
Phase 2: Expansion and Scaling	12–36 Months	• Scale deployment based on pilot results • Implement multi-site typologies and diverse business models • Integrate complementary charging into wider transport and energy networks	1. **Network Rollout:** Deploy additional park-and-charge facilities, mixed-use hubs, and freight micro-hubs based on prioritisation scores. 2. **Business Model Deployment:** Implement concession, anchor-tenant, and co-investment models across new sites. 3. **Technology Enhancement:** Integrate battery storage, smart charging, and digital platforms network-wide; evaluate V2G feasibility where relevant. 4. **Stakeholder Coordination:** Maintain alignment with local transport, planning, and energy strategies. 5. **Community Engagement:** Continue consultation to ensure equitable distribution and visibility of infrastructure.	• Operational complementary network serving diverse users • Business models tested and optimised for revenue, cost, and community benefit • Evidence base for broader strategic deployment and long-term planning.

Phase 3: Consolidation and Full Network Integration	36–60 Months	• Transition from pilot and incremental expansion to full network maturity • Align infrastructure with long-term decarbonisation and mobility strategies • Optimise operational efficiency and financial sustainability	1. **Network Optimisation:** Adjust capacity, typology mix, and siting based on utilisation and performance metrics. 2. **Advanced Integration:** Incorporate renewables, energy storage, V2G, and mobility hub functions into the network. 3. **Governance Refinement:** Review and adjust contracts, concession arrangements, and community partnerships. 4. **Policy Alignment:** Embed complementary charging solutions into LTPs, planning policies, and zero-emission transport strategies. 5. **Evaluation and Reporting:** Maintain continuous monitoring and reporting to inform future investment decisions and LEVI or grant funding applications.	• Fully operational, strategically aligned complementary charging network • Evidence-driven understanding of user demand, technology performance, and operational cost-efficiency • Framework established for ongoing expansion, technology upgrades, and integration with future mobility innovations.

4 Summary and Recommendations

This section draws together the findings from the report in three sets of recommendations:

- **Section 4.1** summarises the key evidence and conclusions.
- **Section 4.2** sets out practical guidance for LTAs providing structured, decision-ready recommendations that authorities can apply directly to their own programmes using the frameworks developed in this report.
- **Section 4.3** identifies policy recommendations where action above the local level by national government, TfSE, or other bodies would materially improve delivery outcomes.

Section 4.4 closes with next steps for both LTAs and TfSE. Each subsection can be read independently depending on where your priorities lie.

4.1 Summary of key findings

This study has brought together evidence from policy reviews, stakeholder engagement, Local Transport Authority (LTA) survey responses, and technical assessment of on-street charging solutions to identify the main barriers and enablers to delivery at pace and at scale. Across all sections, a consistent set of themes has emerged.

Variation in local context

LTAs operate within highly variable physical, institutional, and political environments. Differences in street typologies, parking pressure, utilities capacity, governance structures, and internal capability significantly affect what can be delivered, how quickly, and at what cost. This reinforces the need for flexible, context-sensitive approaches rather than prescriptive solutions.

Administrative and governance complexity

Multiple approval processes, overlapping controls, and inconsistent interpretations of national guidance increase costs and risk for both LTAs and charge point operators. These burdens are particularly acute for smaller authorities and can discourage investment in locations with lower commercial returns.

Standards and guidance are not always easy to apply on-street

National standards relating to safety, accessibility, and design provide an essential baseline. However, applying these consistently in constrained on-street environments often requires judgement and trade-offs. The absence of shared interpretation leads to cautious decision-making delays, and inconsistent outcomes between authorities.

Equity and accessibility are widely supported but unevenly embedded

There is strong consensus that on-street charging must support residents without off-street parking, disabled users, and commercial drivers who rely on public charging. In practice, however, these considerations are not always systematically reflected in site selection, scheme design, or procurement processes, risking uneven access across places and user groups.

Taken together, these findings point to the need for clearer pathways, proportionate decision-making frameworks, and stronger sub-regional coordination, supported by practical tools rather than additional layers of policy.

4.2 Practical guidance for local transport authorities

The guidance developed through this study has been deliberately structured around readiness and progression, recognising that LTAs are at different stages of maturity.

Rather than prescribing a particular delivery model, this guidance has been designed to help LTAs to:

- Understand their current position across strategy, governance, technical capacity, and market engagement.
- Identify the most appropriate next steps based on local constraints and opportunities.
- Reduce delivery risks by addressing known barriers early in the process.

Key elements of the guidance include:

- Readiness pathways that help authorities prioritise actions depending on whether they are at an early, developing, or scaling stage of delivery.
- Decision-support tools to guide the selection of on-street charging typologies based on street characteristics, user needs and risk.
- Process prompts and checklists to support more efficient navigation of approvals and controls.
- Embedded equity and accessibility considerations, ensuring these are treated as core design requirements.

The guidance is designed to be iterative and adaptive. LTAs are encouraged to revisit and refine the toolkit as schemes progress, lessons are learned, and external conditions (such as funding or standards) evolve.

4.3 Policy recommendations

While many challenges can be addressed locally, this study identified several areas where coordinated policy action would significantly improve delivery outcomes.

Harmonising controls and interpretation

- Promote shared interpretations of how national standards and guidance should be applied in on-street contexts, particularly where constraints require trade-offs.

- Encourage greater consistency across highway authorities to reduce uncertainty for operators working across multiple areas.

Reducing administrative burden

- Streamline approval processes by identifying opportunities for standardisation, clearer delegation, and parallel rather than sequential decision-making.
- Support the use of standard templates, design assumptions, and approval pathways to reduce duplication of effort.

Treat the kerbside as a managed, multi-use asset

- On-street charging should sit within a wider kerbside management framework, acknowledging competing demands such as loading, servicing, taxis, blue badge parking, and short stay activity.
- Charging should not be treated as a fixed, single-use allocation of space.

Supporting equitable access

- Embed accessibility and inclusion explicitly within policy, funding criteria, and programme objectives.
- On-street residential charging should be prioritised in areas with high proportion of households without off-street parking and limited access to alternatives.
- Improve data sharing and transparency so that users can understand not just where charge points are located, but also how accessible they are.

These recommendations are intended to strengthen the connection between national ambition and local delivery, without undermining the flexibility needed to respond to place-specific conditions.

4.4 Next steps

Emerging on-street EV charging solutions offer local authorities a versatile, cost-effective route to expand EV access, support fleets, and achieve decarbonisation objectives. This section brings together three distinct types of recommendation.

1. Strategic recommendations are directed at LTAs and set out practical actions to support effective rollout, structured around the decision frameworks developed in this report.
2. Policy recommendations identify areas where coordinated action above the local level by government, Transport for the South East, or other bodies — would materially improve delivery outcomes.
3. Next steps provide a consolidated action list for authorities looking to move quickly on the areas covered in this report. Each can be read independently, depending on where an authority's priorities lie.

4.4.1 Strategic recommendations

This section sets out six strategic actions that local authorities can take to support effective rollout of a plan to address the charging divide between off-street and on-street EV charging.

Each recommendation follows the structure below:

- **What the research found:** the evidence from stakeholder engagement, LTA surveys, and technical assessment that gives rise to the recommendation.
- **Which framework to use:** the specific analytical tool or decision-support framework developed in this report that addresses the finding.
- **The decision logic:** a worked explanation of how the framework connects to action, including conditional logic (‘if your situation is X, then the implication is Y’) that helps officers apply the framework to their own context.
- **What to do next:** clear actions, each tied to specific sections, tables, or appendices in this report.

The six strategic recommendations above are sequenced to reflect the order of decision-making. In practice, however, the right starting point will vary between authorities depending on where they currently are in their delivery journey.

Appendix D provides a structured readiness framework to help officers locate their authority's current position and identify the most relevant next steps. It is organised around seven dimensions (strategy and policy, kerbside controls and TROs, D-TRO and kerbside data maturity, enforcement capacity, procurement and commercial arrangements, accessibility and inclusion, and emerging solutions readiness) and maps each against three maturity stages: Early, Developing, and Scaling.

Most authorities will show a mixed profile across these dimensions. The framework is designed to be used dimension by dimension, so officers can focus on the areas where gaps are greatest. Each maturity stage includes priority actions tied directly to the frameworks and tools in this report.

A self-assessment summary table is also included to help authorities identify their overall readiness profile at a glance, and to structure conversations with TfSE about where regional support would be most useful.

Recommendation 1: Define your delivery approach before selecting hardware

Recommendation 1: Define your delivery approach before selecting hardware

What the research found

LTA interviews show that this is not as a unified delivery model, and each authority is at various stages of maturity. Instead, local authorities adopt distinct approaches shaped by political context, kerbside pressure, asset ownership, and internal capacity. Consequently, most do not sit neatly in one category across all aspects of delivery: an authority may be mature in procurement but cautious on kerbside controls.

Which framework to use

Authority delivery taxonomy (Section 2.3) and the five-step approach selection method

How to decide

If your current rollout is driven primarily by what LEVI funding permits and which CPO is available, rather than by a deliberate choice about what outcomes you are optimising for, there is a risk of policy drift. This could lead to inconsistent decisions across sites, difficulty defending choices in consultation, and a pipeline that does not build towards a coherent network.
The taxonomy outlines three recognisable approaches derived from the LTA engagement:

- Cautious/low-conflict rollout
- Scaled residential network building
- Targeted/use-case-led

These approaches can be combined by place type. The selection method then provides a structured route to choosing which approach applies where, grounded in kerbside conditions, enforcement capacity, and political context.
The output is a short, documented position that says: ‘In residential streets, we are adopting approach X for these reasons. In town centres, we are adopting approach Y.’
This becomes the basis on which subsequent hardware, TRO, and procurement decisions are made.

What to do next

1. Work through the five selection steps in Section 2.3 with your delivery team. The most important step is Step 1 (clarify objectives) as it is where you will choose whether the next phase of rollout is primarily about equity/coverage, pace/acceptability, utilisation, or public realm protection.
2. Map your current pipeline against the three taxonomy categories. Identify where you are already operating in a particular mode by default, and whether that is the right mode for those locations.
3. For each of your delivery contexts (residential, town centre, transport hub, fleet/taxi, etc), assign an approach and document the rationale. Use this as a standing reference for site selection and consultation.

Recommendation 2: Match infrastructure to the combined needs of users and street environments, not just ease of installation

Recommendation 2: Match infrastructure to the combined needs of users and street environments, not just ease of installation

What the research found

The charger typology assessment shows that no single hardware type performs well in all contexts. User requirements (charging speed, dwell time, accessibility, vehicle footprint) interact with environmental constraints (kerb space, footway width, parking pressure, street heritage) to produce distinct suitability profiles for different user-environment combinations. In practice, many authorities are defaulting to a single hardware type, typically lamppost chargers, across all contexts because it is the most repeatable, even where it may not be the most effective.

Which framework to use

Charger typology matrix (Section 2.4.4), Figure 2.7, Appendix A), user-environment interface matrix (Table 2.9, Appendix C), and hardware summary table (Table 2.8)

How to decide

The typology matrix cross-references four user types (LCV, disabled user, private car, taxi/PHV) against three on-street environments (urban centre, urban residential, suburban residential) to indicate which hardware typologies are well suited to each combination. This does not mean every authority needs every typology. Rather, it provides a structured basis for deciding where a single approach is sufficient and where the user mix demands something different.

For example, if your priority residential streets have multiple take-home commercial vehicles, the matrix indicates that lamppost conversions alone may not provide sufficient power or predictable enough access. Pedestals or post-mounted chargers with time-of-day controls may be more appropriate, or a nearby off-street community charging hub may be considered. Conversely, in suburban residential areas with long dwell times and low kerbside pressure, lamppost conversions may be the right fit.

The point is to make these judgements explicitly, rather than discovering the mismatch after deployment when utilisation is poor or user complaints emerge.

What to do next

1. For each delivery context in your pipeline, identify the dominant user types using the characteristics in Figure 2.5 and the environmental constraints from Figure 2.6.
2. Apply the typology matrix (Figure 2.7/ Appendix A) to check whether your planned hardware type is well suited to the user-environment combination at that location. Where the matrix suggests a different typology, assess whether the cost and operational implications are justified.
3. Use the hardware summary table (Table 2.8) and the detailed technical comparison in Appendix B to compare the installation cost, maintenance, accessibility, and non-user impact characteristics of alternative typologies before committing to procurement.

Recommendation 3: Assess kerbside control and enforcement readiness before committing to managed approaches

Recommendation 3: Assess kerbside control and enforcement readiness before committing to managed approaches
What the research found
The research consistently found that delivery performance is constrained by governance and kerbside management rather than charger technology. Parking controls are described by LAs as the most sensitive constraint, shaping both appetite for TROs and the type of restrictions applied. Some authorities have shifted away from TROs for newer deployments to maintain pace, while others have faced significant opposition when introducing dedicated EV bays. Enforcement capacity varies widely, particularly where county/district responsibilities are split.
Which framework to use
The five-step approach selection method (Section 2.3.2, particularly steps 2 and 3), the DKM readiness assessment (Section 3.2.4), and D-TRO platforms by LA (Section 3.2.4, Table 3.4*)*
How to decide
For DKM, there is a dependency chain: it depends on integrated enforcement, which depends on D-TRO coverage, which depends on basic TRO data quality. Attempting to implement DKM or bookable charging bays without confirming each link in this chain leads to schemes that cannot be enforced credibly, which in turn undermines user confidence and public acceptability. The selection method's step 2 ('let kerbside conditions determine the level of control') and step 3 ('align choices with enforcement and governance capacity') provide a framework for this decision. If enforcement is fragmented or absent, strategies that depend on tight compliance will not work, regardless of how well-designed the infrastructure is. The D-TRO mapping in Table 3.4 provides a starting point for assessing where your authority sits. If you are not yet on a D-TRO platform, interventions that depend on digital restriction data (DKM, booking-led enforcement) are not feasible in the near term, and the priority should be to close that gap.
What to do next
1. For each delivery context in your pipeline, identify the dominant user types using the characteristics in Figure 2.5 and the environmental constraints from Figure 2.6. 2. Apply the typology matrix (Figure 2.7/ Appendix A) to check whether your planned hardware type is well suited to the user-environment combination at that location. Where the matrix suggests a different typology, assess whether the cost and operational implications are justified. 3. Use the hardware summary table (Table 2.8) and the detailed technical comparison in Appendix B to compare the installation cost, maintenance, accessibility, and non-user impact characteristics of alternative typologies before committing to procurement.

Recommendation 4: Treat accessibility as a fundamental design and procurement requirement, not a compliance exercise

Recommendation 4: Treat accessibility as a fundamental design and procurement requirement, not a compliance exercise

What the research found

Stakeholder engagement found that installations may meet individual PAS 1899 requirements yet still be unusable because the overall user journey has not been designed holistically. Cable handling, bay geometry, level access, and the needs of passengers (not just drivers) are all identified as persistent gaps.
Disabled motorists are more likely to plan journeys in advance, and reliability issues amplify anxiety. Predictable, bookable access was strongly supported by disability stakeholders.

Which framework to use

*Accessibility enablers (Section 2.2.4), emerging accessibility solutions (Section 2.2.5), and the charger typology accessibility ratings (*Table 2.8, Appendix B*)*

How to decide

The implication of the stakeholder findings is that accessibility cannot be addressed by specifying compliant hardware and assuming the outcome will be adequate. The user journey extends from identifying a charger online, through navigation, bay approach, vehicle positioning, cable handling, payment, and departure. A failure at any point in this chain makes the installation inaccessible in practice, regardless of what the technical specification says.
This means accessibility expectations need to be embedded in three places:

- **Procurement**: specifying not just equipment but siting, bay layout, and cable management requirements
- **Data transparency:** publishing accessibility features so users can filter before travelling
- **Operational monitoring:** auditing installed infrastructure against the full user journey, not just hardware compliance.

The typology comparison in Table 2.8 and Appendix B provides a starting point for understanding which hardware types perform better or worse on accessibility. However, the report's key insight is that the surrounding environment matters as much as the hardware: a well-specified pedestal charger in a poorly designed bay is still inaccessible.

What to do next

1. Embed the three summary recommendations from Section 2.2.5 into your procurement framework: accessible heights and orientation rules, data transparency requirements, and a commitment to periodic auditing.
2. Review existing installations for the 'quick wins' identified in Section 2.2.5: clearer signage, prominently displayed accessible instructions, and correction of avoidable installation errors such as poor orientation or excessive set-back from the kerb.
3. For new deployments, assess each candidate site against the full user journey (approach, manoeuvring, connection, payment, departure), not just hardware compliance. Consider whether bookable accessible bays aligned with adjacent charge points (Section 2.2.5) could improve predictability for disabled users in high-pressure locations.

Recommendation 5: Use shared and complementary solutions to relieve pressure on the kerb, not replace it

Recommendation 5: Use shared and complementary solutions to relieve pressure on the kerb, not replace it

What the research found

Shared domestic charging, shared depot charging, and off-street complementary solutions (park-and-charge, commercial hubs, mobility hubs, micro-hubs) can all reduce the volume of public on-street charging needed. However, each has specific enabling conditions:

- Shared domestic charging depends on trust between the host and users, platform interoperability, and regulatory clarity.
- Shared depot charging depends on security arrangements, metering systems, and willingness to collaborate across organisational boundaries.
- Complementary off-street solutions depend on land availability, grid capacity, and viable governance models.

Which framework to use

Shared domestic charging enablers and barriers (Section 3.3.2), shared depot charging assessment (Section 3.4), emerging solutions matrix (Table 3.5), governance models summary (Table 3.7), and evaluation framework (Section 3.5.4, Table 3.8)

How to decide

Part 2 serves as an assessment of where each approach is viable and what has to be true for it to work effectively. The enabling conditions identified through stakeholder engagement provide a checklist against which authorities can assess local feasibility before committing resources. For example, shared domestic charging (via Co-Charger) is most effective where hosts can be matched to regular users within a short walking distance.

Similarly, shared depot charging (via Paua Share) is only viable where depot operators are willing to grant third-party access under managed conditions. The First Bus framework of 'inside/flex/outside the fence' provides a useful lens for and initial assessment of which depots in your area might be candidates.

The governance models in Table 3.7 then help determine which commercial arrangement fits each complementary solution: public ownership for park-and-charge on council land, concession models for commercial hubs, co-investment for anchor-tenant-led shared zones, and community ownership for parish-level rural sites.

What to do next

1. Identify where your on-street charging pipeline faces acute constraints (grid capacity, kerbside saturation, political opposition) and assess whether any of the complementary solutions in Table 3.5 could address those constraints at those specific locations.
2. For shared domestic charging, engage with platform providers to assess local coverage and user demand. Consider whether a targeted awareness campaign or small grant scheme (as suggested by Co-Charger in Section 3.3.2) could stimulate uptake in areas where public on-street provision is sparse.
3. For shared depot opportunities, use the evaluation criteria in Table 3.8 to screen potential sites and the governance summary in Table 3.7 to identify the appropriate commercial model. Start with public sector depots (council fleet, emergency services) where collaboration motivations are strongest.

Recommendation 6: Pilot dynamic kerbside management where the operational case is strongest, not where it is easiest

Recommendation 6: Pilot dynamic kerbside management where the operational case is strongest, not where it is easiest
What the research found
DKM is technically credible and commercially plausible, but real-world deployment applied to EV charging remains very limited. Within the TfSE area, no established, fully operational DKM schemes for EV charging bays were identified. The strongest use case is commercial and fleet activity in mixed-use areas where kerbside conflict is actively constraining charging outcomes. Residential lamppost contexts are more complex: they often lack defined TRO-based bays, and booking-led control can be harder to communicate and enforce.
Which framework to use
DKM practical guidance (Section 3.2.5), D-TRO platform mapping (Table 3.4), DKM day-part visualisation (Section 3.2.3, Figure 3.1–3.3), and the commercial readiness assessment (Section 3.2.4)
How to decide
The temptation with DKM is to pilot it in locations where the technology is simplest to deploy (e.g. a few bays in a well-controlled car park). But the report's evidence points clearly to places where kerbside friction is currently suppressing the effectiveness of existing charging infrastructure, or where the need to maintain access for non-charging kerbside uses (loading, servicing, accessible parking) is preventing new charging from being installed at all. The visualisation of use throughout the day (*Figure 3.1–3.3*) illustrates how a single stretch of kerb that serves deliveries in the morning, public charging and Blue Badge access in the afternoon, and outdoor hospitality in the evening. The three scenarios describe real kerbside management challenges that interviewees raised, particularly in town centres and mixed-use high streets. Piloting in these locations generates the strongest evidence of value (demonstrable improvement in utilisation, reduction in conflict, commercial willingness to pay for bookable access) and builds the operational learning needed to scale DKM into other contexts later.
What to do next
1. Identify two to three locations where kerbside conflict is demonstrably constraining charging outcomes: persistent ICEing, low utilisation despite high local demand, or inability to install charging due to competing kerbside needs. 2. Work through the four DKM specification points in Section 3.2.5: start with the right locations, confirm the legal/data baseline, implement booking and entitlement with clear enforcement, and tailor the commercial model to local objectives. 3. Design pilots with clear evaluation metrics that test the propositions from the stakeholder engagement: does bookable access improve utilisation? Does enforcement integration reduce ICEing? Is there commercial willingness to pay for assured kerbside access among fleet operators? Use these findings to build the case for scaling.

4.4.2 Operational next steps

In addition to the strategic actions above, Table 4.1 below sets out the more immediate next steps which can position LTAs to make tangible progress towards delivering more equitable on-street charging provision

Table 4.1: Operational next steps

Recommendation	Description
1. Stakeholder mapping and engagement	• Identify all relevant internal and external stakeholders, including CPOs, DNOs, IDNOs, fleet operators, developers, and community groups. • Establish governance and decision-making structures for project delivery.
2. Site identification and feasibility screening	• Map candidate locations across public and private land. • Conduct preliminary feasibility assessments for accessibility, planning constraints, grid connection, and operational viability.
3. Pilot design and deployment	• Select early-stage pilots representing diverse typologies and user groups. • Define monitoring, evaluation, and reporting metrics to inform scaling decisions.
4. Funding and partnership development	• Align pilot and early deployment with LEVI, local budgets, developer contributions, and potential private investment. • Negotiate commercial arrangements that balance risk, revenue, and long-term flexibility.
5. Data and performance monitoring	• Implement digital platforms to capture utilisation, energy consumption, revenue, and user satisfaction. • Use data to optimise operations, inform business models, and refine site selection for future phases.

4.4.3 Key success factors

Finally, across all elements of delivery, the key success factors below provide an overarching set of principles which should be adhered to:

- **Flexibility:** Ensure modular, scalable infrastructure and adaptable business models.
- **Collaboration:** Maintain active engagement with CPOs, fleets, communities, and energy partners.
- **Evidence-led decision making:** Use data from pilots and early deployments to guide scaling and typology adjustments.
- **Strategic alignment:** Embed complementary solutions within local transport, energy (LAEP and RESP), and regeneration strategies.
- **Equity and accessibility:** Prioritise locations and models that improve access for residents without home charging and under-served communities.

Appendices

Appendix A

Charging typology matrix

Table A.1: Charger typology matrix

		User type			
Environment		**LCV** *Strong prioritisation of time efficiency and reliability over charging cost*	**Disabled user** *Accessibility and reliability must be prioritised over throughput and kerb efficiency*	**Car** *Proximity and simplicity is valued; a balance between convenience and turnover*	**Taxi/PHV** *Prioritisation of charging speed, predictability, and uptime over cost*
	On-street urban centre *High-demand, space-constrained kerbside environment*	**Integrated dual purpose** • Can support rapid/ultra-rapid charging in commercially active areas • Can be located near logistics and servicing hotspots • Kerb footprint efficiency • Revenue models help justify prime street space	**Pedestal** • Fixed, visible, predictable location (more important than invisibility in this context) • Can be designed to universal reach heights • Supports proper cable management • Easy to pair with designated (important given that in urban	**Integrated dual purpose** • Delivers fast top-ups during short urban stops • Compact design limits public realm intrusion • Advertising or dual use offsets low predictability of individual use (car demand is more variable/opportunistic than e.g. LCVs)	**Integrated dual purpose** • Supports rapid top-ups aligned with high daily mileage and limited downtime • Consolidated footprint reduces kerb pressure in busy taxi operating zones • Advertising or multifunctional features help justify use of premium street space

		Other suited typologies: Small rapid charging hubs near delivery hotspots	centres enforcement is already challenging) accessible bays • No interaction with footway beyond the bay Other suited typologies: Wall-mounted (would need to avoid cable crossing pedestrian space)	Other suited typologies: small rapid charging hubs near car parks/transport nodes or edges of pedestrian zones	where taxi demand is continuous but dispersed
	On-street urban residential *Variable parking pressure, longer dwell times, and strong equity and fairness considerations.*	**Pedestal** • Fixed, predictable location near vehicle base • Supports overnight or long-dwell charging • Can be designed for larger vehicles • Clear allocation reduces conflict • However, visual impact and restrictions times would need to be carefully managed Other suited typologies: post mounted	**Post mounted** • High accessibility when well designed (can be designed to be immediately adjacent to kerbside) • Predictable location, which works well with overnight dwell and routine use Other suited typologies: flush pop-up (if low force and intuitive)	**Lamppost conversion** • Minimal additional street furniture; fits naturally into residential streetscapes • Cost-effective and quick to deploy • Suitable for long dwell charging • Scalable: highly scalable where the existing lighting network aligns with charging demand but structurally constrained elsewhere. Other suited typologies: cross-pavement solutions (buried/overhead gantries, pop-up)	**Pedestal** • More robust than post mounted chargers for frequent use • Can deliver higher energy overnight than lamp-post conversions • Fixed location supports predictability • Easier to apply time-of-day or permit controls ie. To control perception of commercial capture from residents Other suited typologies: Wall-mounted chargers

	On-street rural residential *Low-density kerbside environment with long dwell times, limited alternatives, and high reliance on local charging reliability.*	**Pedestal** • Robust and reliable for frequent use • Sufficient power for overnight LCV charging • Easier to maintain and service • Clear, predictable location Other suited typologies: post mounted	**Post mounted** • Highly controllable mounting height and interface layout • Stable, predictable location close to home • Strong reliability when lightly shared or semi-private Other suited typologies: pedestal if paired with accessible bays	**Post mounted** • Small footprint suits rural streets • Adequate power for long dwell charging • Lower cost per unit supports wider coverage Other suited typologies: wall-mounted	**Pedestal** • More robust than bollards for frequent use • Sufficient power to replenish high daily mileage overnight • Predictable and reliable location • Easier to service and maintain remotely Other suited typologies: post mounted

Appendix B

Charger typology technical specifications and attributes

Table B.1: Charger typology by technical specifications and attributes

Hardware	Description	Power level (kW)	Installation cost	Maintenance needs	User accessibility	Non-user impacts	Safety	Sources
Post mounted	A slim, upright EV charge point installed directly on the pavement edge.	7-22	Low-medium. Costs driven mainly by: civil works (small foundations, cable ducting), grid connection (usually modest for 7–22 kW AC) and pavement reinstatement	Routine inspections for impact damage, water ingress, electrical overheating, RCD testing (typically every 6 months), cleaning/ventilation checks, replacement of degraded electronic modules, reactive	Blocking dropped kerbs and narrowing footways. Poor socket height and short cables Trip hazards from cables crossing pavement.	Street clutter if multiple posts installed. Potential to reduce effective pavement width (bollards are less obtrusive than large pedestals but still require space).	Electrical shock or overheating risks if damaged by impact. Trip hazards from cables stretched across footways. Visibility issues if sited poorly (particularly at night or in	West Yorkshire On-street Electric Vehicle Charging Standards Guide IET Guide to Electric Vehicle Charging Infrastructure for Local Authorities

				repairs after collisions.		Possible parking displacement; enforcement may be required. Trip hazards from trailing cables.	cluttered streets).	
Pedestal	A larger, free-standing charger cabinet containing one or more charge points. Pillars are bulkier than bollards, often with multiple sockets, metering, and communication equipment inside.	7-350	Medium-high. Driven by: heavier civil works (foundations, trenching); larger electrical connections and possible upgrades and pace requirements and traffic management.	Similar to bollards but with more internal components: cooling fans, communications, meters. Occasional firmware updates, internal inspections, and reactive repairs.	Larger footprint may obstruct footways if poorly placed. Incorrect height or heavy tethered cables may impact people with reduced mobility. Requires clear approach	Greater physical and visual footprint than bollards. Can narrow pavements or reduce visibility for pedestrians/vehicles. Trailing cables still possible when vehicles park off-line.	Larger cabinet increases collision and obstruction risks. Electrical risks from higher-power units. Public-space hazards if enclosure doors are damaged or left open.	**IET Guide to Electric Vehicle Charging Infrastructure for Local Authorities** **West Yorkshire On-street Electric Vehicle Charging Standards Guide**

	Example: **Qwello,** a public on-street AC charge point operator working with local authorities.			More complex doors, seals, and equipment needing checks.	space for wheelchair users.			

Wall-mounted	A compact EV charger fixed to the wall of an adjacent building (home, business, or boundary wall) but accessible from the street.	7-22	Low. Driven by: no new street furniture, short cabling runs and private property avoids most civil works.	Periodic electrical and connector checks. Occasional cleaning and software updates. Low civil maintenance as pavement infrastructure is unchanged.	Socket height must be compliant (PAS 1899 recommends ~900–1200 mm from ground). Cable reach may limit which parking bays can use the charger. Wall-mounted units inside garages may be difficult for users with limited mobility if the garage is narrow or has obstructions.	Minimal impact on public space. Risk of cable crossing pavement if parking alignment is poor. Low visual impact (blends with the property).	Primary electrical risks at the socket and cable. Trip hazards still possible if cable crosses the footpath. Must ensure no protrusions from the wall obstruct the footway.	

Lamppost conversion	A lamppost-integrated charging solution where the EV charger is installed inside or on the column of an existing streetlight. Example: **CityCharge** in the Netherlands	3-7	Very low-low One of the lowest capital options per location because it re-uses existing civil infrastructure and power supply.	Periodic checks of the connector (or small charging module), lamp column electrical integrity tests, software/network upkeep and reactive repairs. As the charging electronics are simpler and lower power, ongoing maintenance and operating costs are usually lower than pedestal/pillar units.	Socket height fixed by lamppost design (may be high/low). Cable reach can be limited. Harder to visually identify as a charger when not in use.	No added street clutter. Potential trailing cables across pavement. Minor coordination issues if the lighting column needs repair; must coordinate with lighting authority for maintenance.	Combined lighting and charging electrics require robust isolation. Trip risks from cables crossing to vehicle. Potential risks if older lamppost columns lack structural integrity.	**Ubitricity: Lamppost & bollard chargers for on-street charging** **Ricardo: understanding the costs and impacts of on-street charging** **Local council roads innovation group**
Buried gullies	Engineered channels embedded into or across pavements/fo	3-7	Low-medium but varies by site.	Clearing debris (leaves, grit).	Major benefit: eliminates surface cables and reduces trip	Very low visual impact once installed.	Must meet electrical ducting and separation standards if a	**DfT guidance on cross-pavement charging for EVs**

	otways that allow a charging cable to run under, or flush with, the pavement surface between a private home charger (or other fixed charger) and an on-street parked vehicle. Example: **Kerbo Charge**		Driven by: Ground conditions and reinstatement quality, length/complexity of the cable run and economies of scale (multiple installs at once cheaper).	Checks for cracking or uneven surfaces. Occasional inspection of ducting or conduit for wear.	hazards. However, currently, no cross-footway solutions are fully inclusive or compliant to a PAS 1899 standard and some users may have difficulty with some or all of the available products. For example, Motability has identified several accessibility challenges associated with cross-footway solutions: some users may struggle with bending to place the cable into the channel and it can require the vehicle to	Short-term pavement disruption during installation. No exposed cable means minimal risk to passers-by.	permanent cable is buried under a public footway. For example, distance between cross-pavement solution installation and other electrical furniture must comply with electrical safety requirements. Eliminates trailing cable hazards. Risks if pavement reinstatement is poor (uneven surfaces).	**Energy saving trust: cross-pavement charging solutions** **Richmond: Electric vehicle footway channels** **Enfield: Electric vehicle footway channels** **National Grid local authority guide to LAs**

					park precisely aligned with the gully.			
Overhead gantries	Mechanical arm (wall-mounted or free-standing) that supports the cable above the pavement and swings into position. Example: **ChargeArm**. The product itself is a passive mechanical system. The charger/EVSE is mounted to the upright or installed alongside it but the ChargeArm does not provide power.	3-7	Medium. Driven by: mechanical support structure, foundations for upright posts and coordination with private chargers.	Cleaning and lubrication of mechanical components (e.g. base cavity and arm). Inspection of arm movement (extension and retraction, gas-lifts (assists arm movement – replacement ~ every 5 years), and cable strain reliefs. Occasional replacement of mechanical assists (e.g., gas struts).	May require strength or reach to operate the arm. Controls/handles must be positioned accessibly. Reduced trip hazards since cable is elevated.	The arm involves a mechanical movement zone - users must be careful not to have bystanders in the sweep path while extending/retracting. Visible from the street; some neighbours/authorities may object depending on local conservation/heritage contexts.	Public-space risks during arm extension/retraction. Mechanical pinch or collision hazards. Standard electrical risks at the charger connection.	**ChargeArm user manual** **Mer: EV charging with no driveway**

Pop-up/flush-fit	Pop-up chargers are retractable EVSE units installed into the kerbside, pavement, or parking bay. They remain flush with the ground when not in use and rise mechanically when a vehicle is ready to charge. Example: **Trojan Energy**, portable adaptor that connects to a sunken socket in the pavement	7-22	High. Mainly due to: complex groundworks (recessed housing, drainage), mechanical actuation systems and necessary electrical works and robust waterproofing.	Maintenance is higher than simple bollards because of the retractable mechanical elements (hydraulics/electromechanical), drainage, seals and the usual electrical/electronic asset maintenance.	Some units require manual lifting; may be difficult for users with reduced strength. Harder to spot when retracted; requires clear markings/signage.	Very low visual impact when retracted. Minimal obstruction of footways. Clear visibility when raised to prevent collision.	Electrical, mechanical safety (shock absorption / spring support, safety interlocks to prevent collapse while in use and anti-pinch features in some designs) Slips/trips if the lid or surface is not flush or becomes damaged.	**Urban Electric pop-up hub trial** **West Yorkshire On-street Electric Vehicle Charging Standards Guide** **IET Guide to Electric Vehicle Charging Infrastructure for Local Authorities**

Integrated and dual-purpose	Charge points that have been designed to integrate with other infrastructure. This can be existing infrastructure or new hardware that serves a dual-purpose (for example, local information, advertising, road updates). Example: **JOLT** - they operate a public kerbside fast-charging network and sell/operate integrated charging units.	3-25	Medium-high. Larger, heavier units requiring substantial foundations. Complex electrical connections, sometimes with battery integration. Planning requirements for large street furniture. JOLT specifically offers zero-cost installation and maintenance for local authorities.	Preventative maintenance for EVSE, screens, and auxiliary systems. Software updates and monitoring. Structural inspections of tall or heavy enclosures.	Must ensure control panels and sockets meet accessibility height/clear space standards. Larger enclosures must not narrow footways. Potential distraction if screens face pedestrian routes.	Reduces clutter by combining functions but is visually larger. Requires adequate spacing to preserve pedestrian clearway. Screens may draw pedestrian attention, affecting flow.	Electrical risks from high-power electronics and auxiliary systems. Structural risks (tall units must withstand wind loads, vandalism). Public space risks if screens or panels protrude or if users congregate around the unit.	**AIS utilities: commercial EV charger installation** **Public chargepoint impact assessment** **JOLT** **JOLT- boost your commercial property value**

Appendix C

Interface between user type characteristics and environmental constraints

Table C.1: Matrix detailing how certain user type characteristics interact with environmental constraints to inform charger requirements

		User type			
Environment		LCV *Strong prioritisation of time efficiency and reliability over charging cost*	Disabled User *Accessibility and reliability must be prioritised over throughput and kerb efficiency*	Car *Proximity and simplicity is valued; a balance between convenience and turnover*	Taxi/PVH *Prioritisation of charging speed, predictability, and uptime over cost*
	On-street urban centre *High-demand, space-constrained kerbside environment*	Physical constraints: Kerb space competition with loading, deliveries, buses and other commercial uses Larger footprint of LCVs makes bay length and manoeuvring more challenging High pedestrian/cycle flows create street clutter sensitivity	Physical constraints: • Disabled users may require wider bays, side or rear access, and clear circulation space • Street clutter (bollards, cabinets, cables) poses a disproportionate barrier • Proximity matters: excessive walking	Physical constraints: • Severe kerb space competition with loading, servicing, public transport, and micromobility • High pedestrian and cyclist flows - sensitivity to street clutter • Parking often time-limited, fragmented, and contested	Physical constraints: • Extreme competition for kerb space near stations, ranks, hotels, and night-time economy areas • Vehicles need frequent access but cannot dwell for long

		Charging requirements: Need for fast turnaround charging given that downtime has a direct cost (rapid/ultra-rapid) Short dwell times required; overnight charging unlikely in this setting Likely installation complexity but good grid access Operational management: Risk of queuing and bay hogging due to clustered demand in commercial hubs Booking or priority systems may be required; enforcement is harder in busy centres ***fast charging + minimal kerb impact + high utilisation***	distance may effectively exclude use Charging requirements: • Power demand is generally moderate; fast charging is beneficial but not always essential • Longer dwell times are acceptable if access is reliable and stress-free • Charging must be possible without lifting heavy cables or awkward reach Operational management: • Accessible EV bays require strict enforcement to prevent misuse • Time limits must be balanced with user needs (rigid turnover can be exclusionary) • Clear signage and wayfinding essential in busy, visually complex environments • Reactive maintenance is insufficient - uptime is critical (disabled users may not be able to easily	• Bays must support high turnover and clear compliance Charging requirements: • Generally short dwell times (top-up charging rather than full charge) • Fast charging is attractive, but not always essential • Wide variation in vehicle capability and battery size • Demand is spiky and difficult to predict Operational management: Risk of bay hogging if charging is slow or poorly managed Time limits and pricing required to maintain turnover (range and queue anxiety) Clear signage and consistent enforcement essential ***Convenience + turnover + kerbside efficiency***	• High turnover pressure; informal stopping already common • Charging infrastructure must not exacerbate congestion or conflict Charging requirements: Very high power charging required to support long daily mileage Frequent top-up charging throughout the day and night Short dwell tolerance; even 10-15 minutes is significant Operational management: Charging is a direct cost to income; time sensitivity outweighs price sensitivity ***Ultra-fast charging + predictability + queue avoidance***

			move to an alternative charger / a single accessible bay may be the only viable option in the area) ***Guaranteed accessibility + reliability + clear, protected space***		
	On-street urban residential *Variable parking pressure, longer dwell times, and strong equity and fairness considerations*.	Physical constraints: • Residential streets typically have high parking pressure, especially overnight • Kerb space is less commercially active but more "politically" sensitive (ie. Perceptions of fairness and monopolisation) Larger LCV footprint can exacerbate local congestion and resident concerns Street geometry may limit bay length and manoeuvring Charging requirements: • Longer dwell times are possible (overnight or between shifts) Medium power charging is generally sufficient; ultra-rapid less critical	Physical constraints: • Residential streets often have tight footways and informal parking patterns; disabled users may require wider bays, side/rear access, and clear circulation space Street clutter (bins, poles, parked vehicles) can significantly reduce usability Proximity to home is critical; longer walking distances may not be feasible Charging requirements: • Longer dwell times (overnight) are typical and acceptable	Physical constraints: Variable parking pressure Kerbside space shared with multiple users and vehicle types Footways often narrow; street clutter must be minimised Charging requirements: Long dwell times (typically overnight) Low to medium power charging is sufficient for most use cases • Speed is less critical than availability and convenience and using the same rationale, reliability and simplicity matter more than peak performance Operational management: • High risk of bay monopolisation without time limits	Physical constraints: Residential streets not designed for high-turnover commercial use Kerbside space shared with residents, visitors, and deliveries PHVs may be parked near home bases between shift Charging requirements: • Moderate dwell times in this environment (between shifts or overnight) • Energy demand is high due to daily mileage,

		Predictable access is more important than peak power Operational management: • Risk of long-duration bay occupation by LCVs • Potential conflict with residential car users Enforcement is possible but again politically sensitive Time-of-day restrictions may be necessary (e.g. overnight only) ***Predictable access + longer dwell + residential compatibility***	Charging does not need to be rapid, but must be reliable and easy to operate Cable handling and reach must accommodate seated or low-mobility users Operational management: Risk of misuse or blocking of accessible bays by non-eligible vehicles Time limits should reflect user needs - compounded by the use of non-eligible vehicles (rigid turnover is inappropriate) ***Guaranteed accessibility + certainty of access + residential compatibility***	Need to balance residents, visitors, and permit holders • Enforcement must be light-touch but consistent ***Equitable access + long-dwell compatibility + scalable deployment (demand volume, not intensity, is the dominant challenge)***	but not always time-critical in residential settings • Faster charging than private cars is beneficial, but ultra-rapid is likely not appropriate Reliability is essential: missed charging affects income the next day Operational management: Risk of long-duration occupation of bays by PHVs Potential perception of residential charging being "captured" by commercial users Enforcement must prevent displacement of residents ***Reliable energy provision + moderate speed***

					+ controlled residential impact
	On-street rural residential *Low-density kerbside environment with long dwell times, limited alternatives, and high reliance on local charging reliability*.	Physical constraints: Low-density streets with ample kerb space relative to demand Limited or no footways in some locations Off-street parking may exist but is not universal Charging requirements: • Long dwell times (overnight, sometimes multiple days) • Lower power charging may generally acceptable due to dwell length Reliability is critical: alternatives may be many miles away Ability to fully recharge overnight is important for next-day operations Operational management: • Low risk of queuing or competition • Enforcement is minimal and informal Infrastructure must work with limited on-site support	Physical constraints: Low-density streets with relatively unconstrained kerb space Footways may be narrow, intermittent, or absent Surfaces and gradients may be uneven Distance from home to charging location is a critical constraint Charging requirements: Long dwell times (overnight or multi-day) are acceptable Low to medium power charging is sufficient Charging must be highly reliable - alternatives may be many miles away (consistent factor across this environment) ie. Users may rely entirely on a single accessible charging location Operational management:	Physical constraints Low-density residential streets with generally ample kerb space Footways may be narrow, discontinuous, or absent Off-street parking exists for some households, but not all Charging requirements: Long dwell times (overnight or multi-day) Low power charging is generally sufficient for daily driving patterns Charging speed is not time-critical Reliability matters more than performance Operational management: Very low risk of queuing or conflict Chargers may be lightly used but highly relied upon Faults can have disproportionate impact due to distance to alternatives	Physical constraints: Low-density residential streets with generally ample kerb space Off-street parking may exist but is not guaranteed Long distances to alternative charging locations (not much variation from other user types in this setting) Charging requirements: High daily mileage relative to private cars Long dwell times between shifts or overnight Charging does not need to be ultra-rapid, but must be sufficient to fully replenish Reliability is critical: failure may mean

		Faults may go unreported or unresolved for longer ***High reliability + overnight sufficiency + low-density compatibility***	Low risk of competition or queuing Charger availability depends more on design clarity than regulation Maintenance response times may be longer due to location ***Guaranteed accessibility + maximum reliability + proximity to home***	**Reliable coverage + low-power compatibility + cost effectiveness**	loss of income and long detours Operational management: Very low risk of queuing or conflict Limited enforcement presence Fault resolution may take longer due to location (Again, does not really vary much by user type in this environment context) ***High reliability + overnight energy sufficiency + cost-proportionate provision***

Appendix D

On-street charging: Readiness pathways

Purpose and how to use this framework

The stakeholder engagement underpinning this report confirms that LTAs across the TfSE area are at markedly different stages of delivery maturity. Some have deployed thousands of charge points under structured multi-year programmes, while others are still navigating their first LEVI-funded procurement. A single set of recommendations applied uniformly to all authorities would inevitably be too ambitious for some and too basic for others.

This framework addresses that problem by structuring guidance around three maturity stages (Early, Developing, and Scaling) across seven dimensions that collectively determine an authority's readiness to deliver effective on-street charging. For each dimension, it provides:

- A maturity profile describing what Early, Developing, and Scaling looks like in practice, so that officers can honestly locate their authority's current position.
- Priority actions that are specific to that maturity stage, each tied to a specific section or framework within this report.
- Cross-references to the relevant analytical tools, so the pathway connects directly to the evidence and decision-support frameworks developed in earlier sections.

Most authorities will not sit at the same maturity level across all seven dimensions. An authority might be Scaling in procurement but Early in D-TRO maturity. This is expected and reflects the findings from the LTA survey and interviews.

The framework is designed to be used dimension-by-dimension, allowing authorities to identify their specific gaps and prioritise accordingly.

The seven dimensions

1. Strategy and policy
2. Kerbside controls and TROs
3. D-TRO and kerbside data maturity
4. Enforcement capacity
5. Procurement and commercial arrangements
6. Accessibility and inclusion
7. Emerging solutions readiness

The three maturity stages

Below is a description of the three stages of maturity used across the seven dimensions of delivering on-street charging.

Early	Developing	Scaling
The authority is in the early stages of on-street charging delivery. Activity is typically ad hoc, grant-led, and not yet governed by a formal strategy or repeatable processes. The priority is to establish foundations.	Delivery is underway with some structured processes, but coverage, consistency, and integration are incomplete. The priority is to consolidate, fill gaps, and build the enabling conditions for more advanced approaches.	The authority has a mature delivery programme with place-differentiated approaches, structured procurement, and systematic monitoring. The priority is to optimise, integrate emerging solutions, and lead regional practice.

Readiness pathways by dimension

The following pages set out the maturity profiles and priority actions for each of the seven dimensions. Each is designed to be read independently, so authorities can focus on the dimensions where they have the greatest gaps.

1. Strategy and policy

Early	Developing	Scaling
Where you are now	***Where you are now***	***Where you are now***
No published EV charging strategy or policy. Charging is delivered opportunistically, often driven by individual funding bids rather than a strategic framework. Objectives for rollout have not been formally set.	An EV charging strategy exists or is in development but has not been formally adopted or does not yet differentiate by place type or user segment. Rollout is guided by broad ambition rather than place-specific logic.	A mature, adopted strategy with place-specific delivery logic, clear coverage targets, and differentiated approaches for residential, commercial, and specialist use cases. The strategy is periodically reviewed.
Priority actions	***Priority actions***	***Priority actions***
1. Articulate a short statement of intent for on-street charging, clarifying primary objectives (equity, pace, utilisation, accessibility) using the framework in Section 2.3.2. **2.** Use the authority taxonomy (Section 2.3) to identify which delivery approach best reflects your current political and operational context and document the rationale. **3.** Secure a political mandate (e.g. Cabinet paper or committee report) that establishes on-street charging as a strategic priority and provides officer-level delegation for site selection.	**1.** Refine the strategy to differentiate by delivery context (residential, town centre, transport hub, fleet/taxi) as set out in Section 3.3.2 step 4. **2.** Define explicit coverage targets (e.g. walk-to-charger distances) for residential areas and service-level expectations for priority user segments. **3.** Adopt the adaptive approach described in Section 2.3.2 step 5: build in formal review points linked to utilisation data, complaint volumes, and operational performance.	**1.** Integrate on-street charging into the wider kerbside management framework (Section 4.3), treating charging as one use among loading, servicing, taxis, and Blue Badge access. **2.** Align the charging strategy with Local Transport Plan, grid capacity, and regeneration objectives. **3.** Use the PEST framework (Section 2.5) to stress-test the strategy against political, economic, social, and technological change scenarios, with particular attention to battery technology and mass-market adoption behaviour.
Key report sections: *Sections 2.3, 2.3.2*	**Key report sections:** *Sections 2.3.2, 2.5*	**Key report sections:** *Sections 2.5, 4.3*

2. Kerbside controls and TROs

Early	Developing	Scaling
Where you are now	***Where you are now***	***Where you are now***
On-street charging is deployed without TROs or dedicated bays. Informal compliance is relied upon. There is limited understanding of which kerbside restrictions currently apply at candidate locations.	TROs are used selectively, often in town-centre or high-street contexts with time-limited restrictions. Residential deployments may still lack formal controls. The TRO process is functional but slow.	A mature, place-differentiated TRO framework is in place. Residential, commercial, and specialist bays each have standard restriction templates. The authority is ready to explore dynamic or time-varying controls.
Priority actions	***Priority actions***	***Priority actions***
1. Map the existing TRO position for planned and potential charging locations. Identify whether current restrictions would conflict with, support, or be neutral to charging use. **2.** Assess whether a no-TRO approach is a deliberate policy choice (cautious rollout) or a capacity constraint. If the latter, identify the specific bottleneck (legal, resource, political) and plan to address it. **3.** For early deployments, adopt the design choices described in Section 2.1 that minimise conflict without TROs: no bay markings, small column signage only, avoidance of frontage placements.	**1.** Develop a standard TRO approach for each delivery context (residential, town centre, transport hub) so that the restrictions question is resolved by place type rather than reopened for every site. **2.** Pilot dedicated EV bays in a subset of locations to build the utilisation case before expanding, as described by interviewees in Section 2.1. **3.** Identify whether app-based charging fees could substitute for or complement existing parking controls and resolve the regulatory interface (Section 2.1).	**1.** Assess readiness for dynamic kerbside management using the practical guidance in Section 3.2.5: right locations, legal/data baseline, enforcement integration, and commercial model. **2.** Commission a reconciliation survey to check that legal TRO records match on-street reality before layering DKM on top.
Key report sections: *Sections 2.1, 2.3.1*	**Key report sections:** *Sections 2.1, 2.3.2*	**Key report sections:** *Section 3.2.5*

3. D-TRO and kerbside data maturity

Early	Developing	Scaling
Where you are now	***Where you are now***	***Where you are now***
TRO records are held as a bank of PDFs or paper documents. No D-TRO platform is in use. There is no consolidated digital view of kerbside restrictions, bay extents, or operating hours.	A D-TRO platform is in place for part of the area, or digitisation is underway. Some kerbside data is available digitally, but coverage is incomplete and may not include EV-specific restriction categories.	Comprehensive D-TRO coverage with accurate, current records. The D-TRO platform provides a single source of truth for kerbside allocation and is integrated with enforcement and CPO systems.
Priority actions	***Priority actions***	***Priority actions***
1. Assess the current state of TRO records and identify the scale of the digitisation task. Prioritise areas where charging is planned or where kerbside conflict is most acute. **2.** Review the D-TRO platforms active in the TfSE area (Table 3.4) and engage with providers to understand costs, timelines, and integration options. **3.** Begin building an asset database that cross-references lamp columns, cable gullies, charge points, and existing kerbside designations (as described in Section 2.1).	**1.** Extend D-TRO coverage to all areas with current or planned charging infrastructure. **2.** Work with your D-TRO provider to ensure EV bay types are accurately represented, noting the data model gaps identified by AppyWay (Section 3.2.4): lamppost charging categories and gully charging are not yet consistently adopted. **3.** Integrate the D-TRO platform with charging-focused planning tools (e.g. Chargepoint Navigator) so teams can view constraints in one place when assessing candidate sites.	**1.** Use the D-TRO platform as the foundation for DKM: publish bay inventories to CPOs, support live dashboard reporting, and enable enforcement integration via API (Section 3.2.4). **2.** Implement live restriction feeds to enforcement partners so that booking-led compliance checks are operationally credible (Section 3.2.2). **3.** Contribute to TfSE's regional harmonisation efforts by sharing D-TRO standards and lessons with peer authorities.
Key report sections: *Sections 2.1, 3.2.4, Table 3.4*	**Key report sections:** *Sections 3.2.4, Table 3.4*	**Key report sections:** *Sections 3.2.2, 3.2.4*

4. Enforcement capacity

Early	Developing	Scaling
Where you are now	***Where you are now***	***Where you are now***
No dedicated enforcement of EV charging bays. Parking enforcement may be provided by a district/borough with limited or no coordination on charging compliance. Enforcement is reactive rather than planned.	Enforcement of EV bays is operational in some locations (typically town centres/high streets with existing controlled parking). Coverage is patchy and may not extend to residential areas. Enforcement data is not linked to charging utilisation data.	Enforcement is integrated with D-TRO and (where applicable) DKM platforms. Booking-led compliance checks are operational. Enforcement data feeds into utilisation and scheme performance reporting.
Priority actions	***Priority actions***	***Priority actions***
1. Map the enforcement landscape: who is responsible (county vs district), what capacity exists, and whether EV bay enforcement is within current operational scope. **2.** For immediate deployments, design charging locations that do not depend on enforcement for effectiveness (no-TRO lamppost models, avoidance of contested frontages). **3.** Begin dialogue with enforcement partners about integrating EV compliance into existing patrol patterns.	**1.** Develop a proportionate enforcement approach for each delivery context, recognising that town-centre bays may need active enforcement while residential locations may rely on lighter-touch approaches. **2.** Test integration of D-TRO/ booking data with handheld enforcement devices in pilot locations (Section 3.2.4). **3.** Establish a feedback loop between enforcement observations and scheme design: where ICEing or overstay is persistent, escalate to formal controls.	**1.** Implement end-to-end DKM enforcement workflows: live restriction data, booking verification, and automated alerts for non-compliance (Section 3.2.2). **2.** Explore technology-assisted enforcement (ANPR cameras, AI-powered monitoring) for high-value or high-conflict locations (Section 3.2.4). **3.** Review enforcement data to identify whether current restriction designs are effective and adjust TRO templates accordingly.
Key report sections: *Section 2.1*	**Key report sections:** *Sections 2.1, 3.2.2, 3.2.4*	**Key report sections:** *Sections 3.2.2, 3.2.4*

5. Procurement and commercial arrangements

Early	Developing	Scaling
Where you are now	***Where you are now***	***Where you are now***
No structured procurement for on-street charging. Deployment is grant-led and ad hoc. The authority has limited experience of CPO commercial models and may rely on a single operator relationship.	One or more structured procurements have been completed, typically organised by power band (e.g. up to 8 kW, 8–50 kW, 50+ kW). Commercial terms are understood but may not be differentiated by place type.	A mature procurement framework with differentiated approaches by place type and power band. Multiple CPO relationships are in place. Performance monitoring is systematic.
Priority actions	***Priority actions***	***Priority actions***
1. Review the governance models summarised in Table 2.1 and Section 3.5.3 to understand the range of options (public ownership, concession, anchor-tenant, co-investment, community). **2.** Before going to market, clarify what the authority is optimising for: control, pace, revenue, or coverage. This determines which model is appropriate. **3.** Engage with CPOs early to understand their commercial requirements, including minimum viable utilisation thresholds and risk allocation preferences.	**1.** Tailor commercial models to delivery context: concession or revenue-sharing for commercially viable town-centre locations; co-investment or public ownership for lower-demand residential areas. **2.** Embed accessibility specifications in procurement documents using the end-to-end recommendations from Section 2.2 (socket heights, cable management, bay geometry). **3.** Negotiate data-sharing clauses that give the authority visibility of utilisation, reliability, and user satisfaction metrics.	**1.** Review contract performance against the evaluation criteria in Table 3.8 (demand, feasibility, energy, financial viability, community impact, strategic alignment). **2.** Explore how shared domestic and shared depot models (Sections 3.3, 3.4) can complement contracted CPO provision, particularly for commercial vehicle users. **3.** Consider DKM integration as a value-add in future procurement rounds: can booking functionality improve CPO utilisation enough to support improved commercial terms?
Key report sections: Table 2.1, *Section 3.5.3*	**Key report sections:** *Sections 2.2, 3.5.3*	**Key report sections:** *Sections 3.3, 3.4, 3.5.3, Table 3.8*

6. Accessibility and inclusion

Early	Developing	Scaling
Where you are now	***Where you are now***	***Where you are now***
Accessibility is acknowledged as important but is not systematically embedded in site selection, design, or procurement. PAS 1899 is referenced but practical application is inconsistent.	Accessibility requirements are specified in procurement documents. Some auditing has been undertaken. However, the holistic user journey (bay approach, manoeuvring space, cable handling, payment) may not be consistently addressed.	Accessibility is embedded as a core design requirement across all procurement, site selection, and operational monitoring. Data is published and audits are repeated as standards evolve.
Priority actions	***Priority actions***	***Priority actions***
1. Adopt the three summary recommendations from Section 2.2.4: embed accessibility expectations in procurement, improve data transparency so users can filter by accessibility features, and commit to periodic auditing. **2.** Review/audit existing installations for avoidable errors (poor orientation, excessive set-back, obstructed approach paths) and prioritise quick wins (Section 2.2.4). **3.** Engage with local disability stakeholders (e.g. Disabled Motoring UK, Motability) to understand specific barriers experienced by users in your area.	**1.** Move beyond compliance-checking to holistic user-journey assessment, recognising that installations can meet individual PAS 1899 requirements yet still be unusable (Section 2.2.1). **2.** Consider bookable kerbside space for accessible bays, particularly where Blue Badge bay allocation can be aligned with adjacent charge points (Section 2.2.5). **3.** Ensure accessibility data (bay dimensions, level access, cable type, payment methods) or 'accessibility assured' bays are published and filterable in public-facing charge point databases.	**1.** Pilot demand-led accessible provision: use DKM to dynamically allocate accessible bays at times and locations where demand data indicates they are most needed. **2.** Track emerging technologies and complementary solutions (e.g. assisted cable management, shared domestic charging,) and plan for their integration as they mature. **3.** Share accessibility audit findings and procurement language with peer authorities through TfSE to support regional consistency.
Key report sections: *Section 2.2*	**Key report sections:** *Sections 2.2.1, 2.2.5*	**Key report sections:** *Sections 3.2, 3.5*

7. Emerging solutions readiness

Early	Developing	Scaling
Where you are now	***Where you are now***	***Where you are now***
Awareness of DKM, shared domestic charging, and shared depot models is limited. The authority has not engaged with platform providers or explored pilots. Emerging solutions are seen as 'nice to have' rather than part of the delivery pipeline.	The authority has engaged with emerging solution providers and may have one or more pilots in planning or early operation. However, emerging solutions are not yet integrated into the mainstream delivery pipeline.	Emerging solutions are integrated into the delivery strategy alongside conventional on-street infrastructure. Pilots have generated evidence that informs scaling decisions. Data from shared and DKM platforms feeds into network planning.
Priority actions	***Priority actions***	***Priority actions***
1. Review the emerging solutions covered in Part 2 of this report and identify which address acute constraints in your area (e.g. DKM where ICEing is a problem; shared domestic charging where public infrastructure is sparse). **2.** Engage with one or two platform providers (Co-Charger, AppyWay, Paua) to understand their propositions, data requirements, and what a pilot would involve. **3.** Promote shared domestic charging awareness among residents through council communications, recognising it as a complement to (not substitute for) public infrastructure (Section 3.3).	**1.** Design targeted DKM pilots for locations where kerbside conflict is clearly constraining charging outcomes, following the practical guidance in Section 3.2.5. **2.** For shared domestic charging, consider a local grant scheme to incentivise early adopters who begin sharing their chargers, as suggested by Co-Charger (Section 3.3.2). **3.** For shared depot charging, identify potential public sector depot partners (council fleets, emergency services, bus operators) and explore the First Bus 'inside/flex/outside the fence' framework (Section 3.4.1).	**1.** Scale DKM from pilot locations to a network-level kerbside management approach, using the phased roadmap in Table 3.9. **2.** Integrate data from shared domestic and depot platforms into strategic assessments of where public on-street provision is most and least needed. **3.** Participate in TfSE-coordinated cross-authority pilots and shared procurement opportunities for DKM and shared charging platforms.
Key report sections: *Sections 3.2, 3.3, 3.4*	**Key report sections:** *Sections 3.2.5, 3.3.2, 3.4.1*	**Key report sections:** *Sections 3.2, 3.3, 3.4, Table 3.9*

Self-assessment summary

The table below provides a simple self-assessment tool. For each dimension, officers should identify the maturity profile that most closely describes their authority's current position and note it in the corresponding column.

This creates a snapshot of readiness that can be used to prioritise actions, brief senior officers, and structure conversations with TfSE about where regional support would be most valuable.

Dimension	Early	Developing	Scaling
Strategy and policy			
Kerbside controls and TROs			
D-TRO and kerbside data maturity			
Enforcement capacity			
Procurement and commercial arrangements			
Accessibility and inclusion			
Emerging solutions readiness			

Interpreting your assessment

Predominantly Early: Focus on establishing the foundations. The priority actions in the 'Early' column will help build the strategic, governance, and data prerequisites that more advanced approaches depend on. Do not attempt DKM or dynamic controls until the underlying D-TRO, enforcement, and policy foundations are in place.

Predominantly Developing: Focus on consolidation and targeted piloting. The authority has working delivery processes but inconsistencies across place types or user segments. The priority is to fill gaps, standardise approaches, and begin testing emerging solutions in locations where the enabling conditions exist.

Predominantly Scaling: Focus on optimisation and integration. The authority is well-positioned to lead on exploring DKM deployment, integrate shared charging models into the delivery strategy, and contribute to regional harmonisation. The priority is to move from individual scheme delivery to network-level management.

Mixed profile: Most authorities will show a mixed profile. In this case, identify the dimensions that are furthest behind relative to your strategic ambitions. A 'Scaling' authority in procurement that is 'Early' in D-TRO maturity has a specific bottleneck that will constrain the effectiveness of future deployments.

How to use this report: a navigation guide

This report contains several distinct analytical frameworks and decision-support tools. The table below maps common LTA questions to the specific sections and tools that address them.

If you are asking...	Use this tool	Found in
What strategic approach should we take to on-street charging?	Authority delivery taxonomy	Section 2.3
What hardware should we deploy in different street types?	Charger typology matrix	Section 2.4.3, Appendix A
How should we match chargers to different user groups?	User-environment interface matrix	Section 2.4.2, Table 2.9, Appendix C
What external trends should we plan for?	PEST analysis framework	Section 2.5, Table 2.10
Is DKM right for our area, and where should we start?	DKM practical guidance and readiness checklist	Section 3.2.5
Could shared domestic charging help bridge gaps in our network?	Shared domestic charging enablers and barriers	Section 3.3.2
How can we make better use of depot and fleet sites?	Shared depot charging assessment	Section 3.4
What complementary off-street solutions should we consider?	Emerging solutions matrix	Section 3.5.1, Table 3.5
Which governance and commercial model fits our context?	Governance models summary	Section 3.5.3, Table 3.7
How should we evaluate and prioritise sites?	Evaluation framework and decision pathway	Section 3.5.4, Table 3.8
What is our overall readiness to deliver?	Readiness pathways (this section)	Appendix D

Control Information

Prepared by	Prepared for
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