National Audit Office

REPORT

Public chargepoints for electric vehicles

Department for Transport

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National Audit Office

Public chargepoints for electric vehicles

Department for Transport

Report by the Comptroller and Auditor General

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Gareth Davies
Comptroller and Auditor General
National Audit Office

6 December 2024

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Key facts

300,000
estimated minimum number of public chargepoints needed by 2030

64,632
number of open access public chargepoints installed as at July 2024

2,377
number of ultra-rapid chargepoints within one mile of the strategic road network at July 2024, against a target of 2,500 by 2030

15%	proportion of public chargepoints in England that are in rural areas, as at July 2024
£450 million	funding allocated for the Local Electric Vehicle Infrastructure (LEVI) Fund, to support local authorities in procuring chargepoints near peoples' homes, between 2022-23 and 2024-25
Over 100,000	forecast number of chargepoints that will be supported by LEVI
62%	of motorway service areas which reported they had six or more ultra-rapid chargepoints in July 2024. The government set an aim for all motorway service areas to have at least six ultra-rapid chargepoints by the end of 2023
Around 10%	estimated proportion of motorway service areas with enough power capacity needed to meet projected chargepoint demand to at least 2035
£950 million	funding announced for the rapid charging fund, intended to future-proof electricity capacity on the strategic road network

Summary

Background

1 Reducing emissions from road transport is the largest intervention the government can make towards its goal of achieving net zero carbon emissions by 2050. Transport is the most carbon-emitting sector of the UK economy, causing 28% of domestic CO_2 emissions in 2022, of which just over half came from cars and taxis. The government has committed to phasing out new petrol and diesel car sales by 2030, with all new cars and vans sold being zero-emission from 2035. A key way to encourage drivers to use electric vehicles is to provide public chargepoints. Drivers need to be confident that these are widely available and reliable enough to support the length of their journeys.

2 Public chargepoints are installed and maintained by chargepoint operators, private businesses who need enough people to use electric vehicles in an area for it to be profitable for them to install chargepoints. However, to give drivers confidence to switch to electric vehicles, these chargepoints need to be installed in sufficient numbers and at key locations. This may not happen at the pace and in the locations needed without government intervention.

3 The Department for Transport (DfT) leads on the strategy to reduce carbon emissions from cars. The Office for Zero Emission Vehicles (OZEV) is a team working across government to support the transition to zero-emission vehicles, with staff from both DfT and the Department for Energy Security & Net Zero (DESNZ), but which ultimately reports to DfT.

4 In 2022, DfT published *Taking charge: the electric vehicle infrastructure strategy* (the strategy), which set out its vision to remove charging infrastructure as a barrier to the adoption of electric vehicles, estimating that a minimum of 300,000 public charge points by 2030 would be needed to meet this. DfT identified that its role was to accelerate a nationwide rollout of public chargepoints and remove barriers to uptake. The strategy set out a series of commitments to achieve this, including allocating £1.5 billion to two key areas of government intervention where the market alone was unlikely to produce the outcome wanted.

- **Local chargepoints** so that people can charge their vehicle near where they live, typically using slower chargepoints overnight. DfT established a £450 million programme – the local electric vehicle infrastructure (LEVI) fund – to part-fund and support local authorities in England in this work. This built on its previous on-street residential charging scheme which awarded £84 million of grants to local authorities between 2017 and 2024.
- **Rapid charging on motorways and major A-roads (the strategic road network)** so that people can charge vehicles on longer journeys. The government needs to ensure that there is sufficient electricity capacity to support the rollout of rapid public chargepoints. In 2020, the government committed to set up a rapid charging fund to part-fund the capital costs of future-proofing electricity connections along the strategic road network, later announcing £950 million for this.

Scope of the report

5 This report examines whether DfT is achieving value for money in the rollout of electric vehicle infrastructure. We assess:

- whether DfT is on track to meet its ambitions for 2030 and the commitments in its strategy;
- whether DfT has set up to deliver its key interventions to support local charging and rapid charging on the strategic road network, and has effectively tackled barriers to installing more chargepoints; and
- whether DfT has intervened effectively to improve customer experience of charging infrastructure.

The fieldwork for this report was completed between June and October 2024. We previously examined governments efforts to support the rollout of infrastructure in our report *Reducing carbon emissions from cars* in 2021.[1] That report also examined DfT's broader efforts to encourage the uptake of electric vehicles, such as subsidy grants for drivers to purchase electric vehicles, which we do not examine in this report. Chargepoint numbers used refer to public, open access charging devices that are usable without a need for a specific make of vehicle. Devices may offer one or multiple connecting sockets. Except where otherwise stated, data relating to the number of chargepoints installed are provided by Zapmap (www.zap-map.com), who report they have coverage of over 95% of the network, meaning total numbers may be higher.

1 Comptroller and Auditor General, *Reducing carbon emissions from cars*, Session 2019–2021, HC 1204, National Audit Office, February 2021.

Key findings

Progress against the strategy

6 The number of public chargepoints being installed is on track to meet the 300,000 chargepoints that DfT estimated is the minimum needed by 2030.
As of July 2024, 64,632 public chargepoints have been installed, which is in line with DfT's expectations of what would be required at this point. The majority of public chargepoints have been installed through private investment, with around a quarter receiving part-funding from central government. DfT's LEVI programme currently forecasts that it will support the installation of at least 100,000 public chargepoints over the next few years, and DfT anticipates continued growth in private installations will support the trajectory needed to reach 300,000 by 2030. The precise number of public chargepoints needed is uncertain, and depends on several assumptions, including how people recharge their vehicles. DfT periodically refreshes its modelling of potential future demand for public chargepoints and, to date, the mix of rapid and slow chargepoints has proceeded broadly in line with expectations. DfT currently estimates that the demand for public chargepoints in 2030 will be in the range of 250,000 to 550,000. It had previously estimated a range of 280,000 to 720,000. DfT will need to continue to update the likely range to determine if the number of installations is on track (paragraphs 1.9 to 1.11 and Figure 3).

7 DfT's national estimate for a minimum of 300,000 public chargepoints does not consider their locations, which so far are largely in the south and in urban areas.
Chargepoint installation to date has been led by the needs of early adopters of electric vehicles. As a result, around 44% of all public chargepoints in the UK are in London and the South-East, with London alone having more than twice as many chargepoints per capita than any other region. Only 15% of chargepoints in England are in rural areas. DfT has designed its current programmes to help address regional differences but has no specific targets for how public chargepoints should be distributed across different regions and across urban and rural areas. DfT's ambition for the minimum number of public chargepoints by 2030 could be met without achieving the spread of chargepoints needed to support road transport across the whole country (paragraph 1.12 and Figure 4).

8 DfT has carried out the majority of commitments in its strategy. However, most of these were short-term actions, and DfT now needs to identify where it may need to intervene to support further growth. DfT's strategy contained 38 commitments intended to accelerate the pace of chargepoint installation, address barriers to installation, and improve public confidence in the public charging network. Over 75% of its commitments were expected to be complete within one year, as they were intended to lay the groundwork ahead of a period of rapid growth. Two years on from the strategy, 84% of the commitments have been carried out. DfT will need to assess what actions it needs to take to support a more mature chargepoint marketplace and a larger user population. DfT also plans to build on early work to support the decarbonisation of other vehicle types, such as heavy goods vehicles, that did not feature in its initial commitments (paragraphs 1.14 to 1.15 and Figure 5).

Progress with support for local charging and rapid charging on the strategic road network

9 DfT has increased the number of local authorities planning to install public chargepoints by applying lessons from earlier schemes. DfT designed its LEVI fund to avoid problems of low uptake and engagement. It also aimed to address regional disparities and better allocate money where it is most needed, with additional support to fund local authorities to employ staff to plan for public chargepoints infrastructure. DfT also established a central support body to provide technical advice and support. As a result, all eligible local authorities have engaged with the LEVI fund, and around half have developed a local chargepoint strategy with others in the process of doing so. DfT currently forecasts that LEVI will support the installation of at least 100,000 chargepoints, which would achieve the programme's objective to support the growth of the local chargepoint industry (paragraphs 2.3 to 2.8 and Figure 6).

10 DfT's local chargepoint programme runs until March 2025, but delays mean that many local authorities may need further government support. DfT launched the three-year programme in 2022 and, by October 2024, had issued £242 million of funding for local authorities to develop projects, including £40 million of capability funding. The speed with which DfT intended the programme to move placed pressure on local authorities, who had to build their capability alongside developing projects. It took local authorities longer to develop plans to DfT's standards than expected, and many intended to use a procurement route found to be infeasible late on in the programme. These issues have led to delays; as of October 2024, while virtually all local authorities had developed projects and were in the process of refining these, only 10 projects had been approved for delivery against a March 2025 deadline. Delays have meant that many local authorities will approach the market at a similar time, with concerns that this may lead to failed procurements. Local authorities who piloted the programme are reporting delays, with half of these projects delayed by a year or more. Local authorities report issues including a lack of resource, practical issues with sites, and challenges in securing planning permissions given planning capacity within local authorities. However, DfT intends to issue all remaining funding by March 2025, meaning, without further funding, local authorities will have to deliver their projects without further central support. The government allocated £200 million of funding to support charging infrastructure at the 2024 Budget, including local charging, but DfT has not yet finalised how it will spend this money (paragraphs 2.9 to 2.12 and Figure 6).

11 The number of chargepoints installed within one mile of the strategic road network that can charge vehicles quickly has grown faster than DfT expected. In 2020, the government announced its vision for an ultra-rapid chargepoint network along motorways and major A-roads, aiming to have 2,500 ultra-rapid chargepoints by 2030, rising to 6,000 by 2035.[2] As at July 2024, there are 2,377 ultra-rapid chargepoints and 2,220 rapid chargepoints within a mile of the strategic road network. However, there are currently stretches of major A-roads where there are currently not enough of these chargepoints. DfT is currently examining whether, given recent growth, these gaps are likely to be addressed by industry, and whether and how it may need to intervene in future (paragraphs 2.13 to 2.17 and Figure 8).

2 Statistics, except where otherwise stated, refer to open-access chargepoints that do not require a specific make of vehicle to use. The time taken to charge a vehicle depends on the size of its battery and the chargepoint speed. Ultra-rapid (150kW+) chargepoints will charge most vehicles from 20% to 80% within 30 minutes under ideal conditions, and rapid chargepoints (50kW–149kW) within 60 minutes. There is no industry-agreed definition of rapid and ultra-rapid.

12 There remain gaps in the distribution of ultra-rapid chargepoints at motorway service areas. DfT aimed for every motorway service area in England to have at least six ultra-rapid chargepoints by 2023. DfT anticipated that the private sector would be able to deliver this aim and did not have a good understanding of the barriers that would prevent it being achieved, such as the cost and time needed for even modest electricity grid upgrades. DfT did not allocate funding for this aim, and as barriers became more apparent, DfT engaged with motorway service area operators to encourage them to install chargepoints, assist them in requesting grid connections and also make use of other public sector schemes to improve electricity capacity. At the end of 2023, around half of motorway service areas reported they had at least six ultra-rapid chargepoints, increasing to 62% by July 2024. DfT anticipates that around 100 service areas will meet its ambition by July 2025. Including rapid chargepoints (all those at 50kW and above), there are an average of eight public rapid chargepoints per motorway service area (965 in total, of which 775 are ultra-rapid), but there is significant variation between different locations, with provision highest in the South East (paragraph 2.18).

13 DfT had not fully developed the rapid charging fund when it was announced in 2020, and it has proved more difficult than anticipated to implement. DfT analysis indicates that, at July 2024, only around 10% of the 114 motorway service areas in England had the power capacity they would need to meet rapid chargepoint demand to at least 2035, with around half needing to increase their capacity by between two and 10 times. In 2020, the government announced the rapid charging fund, intended to part-fund upgrades to electricity capacity on the strategic road network so that sites could meet future charging demand. DfT anticipated piloting the fund in winter 2022 before a full launch in 2023, but has only opened the pilot for applications in December 2023, with these currently being assessed. DfT redesigned and pushed back its pilot to navigate wider regulatory changes, competition concerns and the risk of legal challenge. Industry stakeholders have expressed frustration at how long it has taken to get this intervention up and running. Motorway service area operators have not typically invested in large energy infrastructure projects, applied for government funding, or needed to request major electricity connection upgrades from electricity network operators. DfT has engaged with the sector to build operators' capability and improve their relationships with electricity network operators. DfT is now assessing its options for how it intervenes further on the strategic road network, such as proceeding with further grant funding or using other means to fund network connections. Further delays to the delivery of network capacity risk it not being in place at sites to support charging demand when needed (paragraphs 2.19 to 2.22 and Figure 7).

14 Processes for planning permissions and electricity grid connections were not designed with chargepoint operators in mind, causing unnecessary additional cost and time to complete. Installing a chargepoint requires engaging with many different bodies, including national and local planning authorities, landowners, and electricity network operators. DfT has worked with industry to identify barriers and has established relationships with wider government bodies to address them. To date, the government has made some changes to make it easier to install chargepoints, but there remain areas for improvement which it is still considering. The government has acknowledged that processes to receive electricity grid connections are also increasingly unfit for purpose, resulting in waits of several years where substantial work is needed to improve network capacity. In 2023, DESNZ and Ofgem put in place a Connections Action Plan, containing a series of actions to address these issues. To date, there have been improvements in the rate at which connections are made, but the connections queue is still growing. Further improvements are intended through a new connections process currently planned for implementation in 2025, as well as through Ofgem's ongoing end-to-end review of the connections process (paragraphs 2.23 to 2.28 and Figure 9).

Improving user experience of charging infrastructure

15 DfT has put in place measures to address recent concerns with the consumer experience of public chargepoints, but will need to build its monitoring capability to respond to future issues. In 2021, DfT consulted on drivers' experiences of using chargepoints. This identified that using public chargepoints was becoming too complex due to each operator having different ways to pay. DfT also found that drivers felt pricing was unclear and were concerned that chargepoints might not be working when they tried to use them. In response, DfT introduced new regulations in 2023, which have progressively come into force since that time. These regulations require chargepoint operators to use a standard metric for prices, standardise payment methods, provide a helpline, and set a 99% minimum reliability standard for each operator's network of rapid chargepoints. It is too early to say if the regulations will work as intended. DfT will need to consider whether any changes are needed based on monitoring and consumer experience. For example, data on rapid chargepoints estimated reliability was at 97% across the entire network in 2023-24, and a snapshot of data from August 2024 suggests some operators still need to make improvements. DfT will need to monitor where less reliable chargepoints are located to ensure locations with persistent poor service do not emerge. Drivers who are solely reliant on public chargepoints pay more to power their vehicle than those with access to private chargepoints, and the government will also need to monitor whether the overall balance of incentives supports these drivers into the future (paragraphs 3.3 to 3.8, and Figures 10 and 11).

16 Rollout of public chargepoints to date has not met the needs of drivers with disabilities, and there is a risk that their needs will remain unaddressed as chargepoint numbers increase. By 2035, 1.35 million disabled drivers are expected to be partially or wholly reliant on public chargepoints. However, many current chargepoints, or their surrounding environment, have features which make them inaccessible to drivers with disabilities. DfT co-sponsored the creation of a new standard which specifies minimum requirements for chargepoint accessibility. However, DfT has not mandated its use, as industry and local authorities have reported that further clarity is needed on what constitutes compliance. DfT does not known how many chargepoints are currently compliant. DfT has established a working group to resolve these issues, including how accessibility should be reported. Should these issues remain unresolved during the continued growth of chargepoint installations in coming years, large portions of the future network could be inaccessible to drivers with disabilities (paragraphs 3.9 to 3.13).

Conclusion on value for money

17 A widespread, easy-to-use and reliable network of public chargepoints is crucial to ensuring that the UK is ready to meet the phase-out of petrol and diesel cars in 2030. To date, chargepoint numbers have increased in line with what is needed and the installation of 300,000 chargepoints by 2030, estimated to be the minimum needed, appears achievable. DfT is navigating a difficult delivery environment to bring its two main initiatives to launch, though later than anticipated. DfT needs to ensure that it manages the risks to the delivery of these programmes, and that they deliver the intended growth in the number of public chargepoints.

18 The sharp increase in public chargepoints expected over the rest of the decade needs to include a greater focus on where the chargepoints are located and how accessible they are. DfT and other government bodies involved must also be ready to meet the challenges and opportunities that come with this growth. Solutions to address costly and time-consuming barriers in planning and electricity network connections must be in place to meet the increased scale of installations needed. They must also monitor how people and chargepoint operators behave, to respond to emerging issues and intervene in areas that may disrupt the transition to electric vehicles.

Recommendations

19 DfT should:

a consider whether developing regional demand forecasts, and demand forecasts differentiating between urban and rural locations, would aid the rollout of public chargepoints;

b develop a set of strategic principles for intervention, to guide its design of future interventions where chargepoint demand may not be addressed by its existing programmes;

c work with local authorities, and the central support body it established to help them, to develop a plan for how to sustain the capability built through the LEVI programme after it ends;

d develop a monitoring framework for the open data it collects through the Public Charge Point Regulations, so that it can understand emerging consumer and operator issues in the chargepoint market, including where regional variations may emerge; and

e ensure that a clear understanding of what constitutes compliance to the chargepoint accessibility standard is determined, so that industry and local authorities can incorporate it into future installations.

Part One

The rollout of electric vehicle infrastructure

1.1 Reducing emissions from road transport is the largest intervention the government can make towards its goal of achieving net zero carbon emissions by 2050. Transport is the most carbon-emitting sector of the UK economy, causing 28% of domestic CO_2 emissions in 2022, of which just over half came from cars and taxis. The government has committed to phasing out new petrol and diesel car sales by 2030, with all new cars and vans sold being zero-emission from 2035.

1.2 This shift to electric cars requires a new network of public chargepoints. While most electric car owners have driveways or garages where they can install a chargepoint for their private use, many people do not have this option. Even where drivers typically charge at home, they may need to charge their car during long journeys.

1.3 Before purchasing an electric car, people need to be confident that they will be able to charge their car for the journeys they make. In practice, this means that charging infrastructure needs to be installed in advance of need. As it is private businesses who install and operate public chargepoints, and need people enough using electric vehicles in an area for them to be profitable, getting these public chargepoints in place may not happen at the pace and in the locations needed without government intervention.

1.4 The Department for Transport (DfT) has policy responsibility for decarbonising transport. In March 2022, DfT published *Taking charge: the electric vehicle infrastructure strategy* (the strategy), setting out how it would develop the public charging network needed to support the phase-out of fossil fuel cars. This included an estimate that at least 300,000 public chargepoints would need to be installed by 2030.[3] The Office for Zero Emission Vehicles (OZEV) is a team working across government to support the transition to zero-emission vehicles, with staff from DfT and the Department for Energy Security & Net Zero (DESNZ), but which ultimately reports to DfT.[4] DfT provides government funding to support public charging infrastructure, having allocated £1.5 billion to its key grant programmes.[5]

3 The estimate of at least 300,000 chargepoints was derived from OZEV's modelling of different demand scenarios. This produced an estimated range of between 280,000 and 720,000 public chargepoints required by 2030.
4 OZEV was previously known as the Office for Low Emission Vehicles (OLEV).
5 These programmes comprise the £950 million rapid charging fund and the £450 million local electric vehicle infrastructure (LEVI) fund. In addition, DfT awarded £84 million of grants to local authorities between 2017 and 2014 through its on-street residential charging scheme.

1.5 This part provides an overview of DfT's electric vehicle infrastructure strategy, and assesses:

- whether the pace of public chargepoints installation is on track to meet the estimated minimum of 300,000 needed by 2030; and
- overall progress against the commitments in the strategy.

The electric vehicle infrastructure strategy

1.6 The roles and responsibilities for the rollout of electric vehicle infrastructure are spread across national and local government, regulators, and private businesses (**Figure 1**).

Figure 1
Roles and responsibilities in the rollout of public chargepoints for electric vehicles

The delivery of public chargepoints is dependent on actions by a wide range of bodies across the private and public sector

Body	Role and responsibility
Chargepoint operators	Private businesses who install and operate public chargepoints. Responsible for making chargepoints accessible and reliable, with clear pricing and data.
Department for Transport (DfT)	Overall policy responsibility for decarbonising transport. DfT leads on the electric vehicle infrastructure strategy and funds its associated programmes.
Office for Zero Emission Vehicles (OZEV)	Team staffed from DfT and DESNZ to support the transition to zero emission vehicles. Responsible for the 2030 chargepoint estimate and the commitments set out in the electric vehicle infrastructure strategy. OZEV ultimately reports through DfT to the Secretary of State for Transport.
Local authorities	Develop and deliver local electric vehicle chargepoint strategies. Responsible for decisions on planning proposals, including power-generating infrastructure.
Department for Energy Security & Net Zero (DESNZ)	Responsible for developing and implementing policies to achieve net zero in the power sector.
Ofgem	Regulates the energy sector, including protecting consumer interests, helping deliver net zero and overseeing grid infrastructure development by network operators.
Office for Product Safety and Standards (OPSS)	Monitors and enforces public chargepoint regulations for aspects such as price transparency, payment methods and reliability.
Devolved administrations	Set the strategy and policy for the chargepoint network in their devolved nation.

Source: National Audit Office analysis of data from the Department for Transport and Ofgem

1.7 DfT has had strategies in place to encourage electric vehicle uptake since 2011. The National Audit Office (NAO) previously reported on DfT's efforts to promote the adoption of electric vehicles, including their associated chargepoints, in 2021.[6] We found that, while there had been an increase in chargepoint infrastructure, it had not yet sufficiently focused on chargepoint availability for drivers without access to off-street parking.

1.8 DfT's most recent strategy sets out how it would support and develop the public charging network needed by 2030 (**Figure 2**). The strategy sets out key actions including:

- the need for government intervention to accelerate less developed areas of chargepoint installation – this is focused on local on-street chargepoints and rapid chargepoints on motorways;
- addressing barriers to private sector rollout; and
- improving user experience of public chargepoints through regulation.

The rollout of public chargepoints to date

1.9 DfT has estimated that at least 300,000 public chargepoints will be needed across the UK by 2030. As of July 2024, 64,632 public chargepoints had been installed, in line with DfT's expectations of the number that would be required at this point (**Figure 3** on page 18).[7] The majority of public chargepoints have been installed through private investment, with around a quarter receiving part-funding from central government.

1.10 Since 2020, the number of chargepoints has increased at an average of around 35% every year and must continue increasing by around a third every year to meet the estimated minimum needed by 2030 (Figure 3). In practice, chargepoint installation may not proceed at a constant rate of growth. DfT's current local grant fund is forecast to support at least 100,000 chargepoints over the next few years, and DfT anticipates continued growth in private installations will support this trajectory.

6 Comptroller and Auditor General, *Reducing carbon emissions from cars*, Session 2019–2021, HC 1204, National Audit Office, February 2021.

7 Numbers used refer to public, open access charging devices that are usable without a need for a specific make of vehicle. Devices may offer one or multiple connecting sockets. Except where otherwise stated, data relating to the number of chargepoints installed are provided by Zapmap (www.zap-map.com), who report they have coverage of over 95% of the network, meaning total numbers may be higher.

Figure 2

The Department for Transport's (DfT's) electric vehicle infrastructure strategy

DfT published *Taking charge: the electric vehicle infrastructure strategy* in March 2022, setting out the key challenges, vision and action plan of building a comprehensive network of chargepoints

DfT's vision for 2030

At least **300,000 public chargepoints** across the UK and that:

- Everyone can find and access reliable public chargepoints wherever they live
- Effortless on- and off-street charging for private and commercial drivers is the norm
- Fairly priced and inclusively designed public charging is open to all
- Market-led rollout for the majority of chargepoints
- Infrastructure is seamlessly integrated into a smart energy system
- Continued innovation to meet drivers' needs, lowering costs and increasing convenience

Key challenges identified in 2022

- The pace of rollout is too slow
- Too often, public charging lets people down
- The business case for commercial deployment can be challenging
- Connecting new chargepoints to the electricity system can be slow and expensive
- Local engagement, leadership and planning

Actions

Focus government intervention on two key sectors:

- Local on-street charging
- High-powered chargepoints on the strategic road network

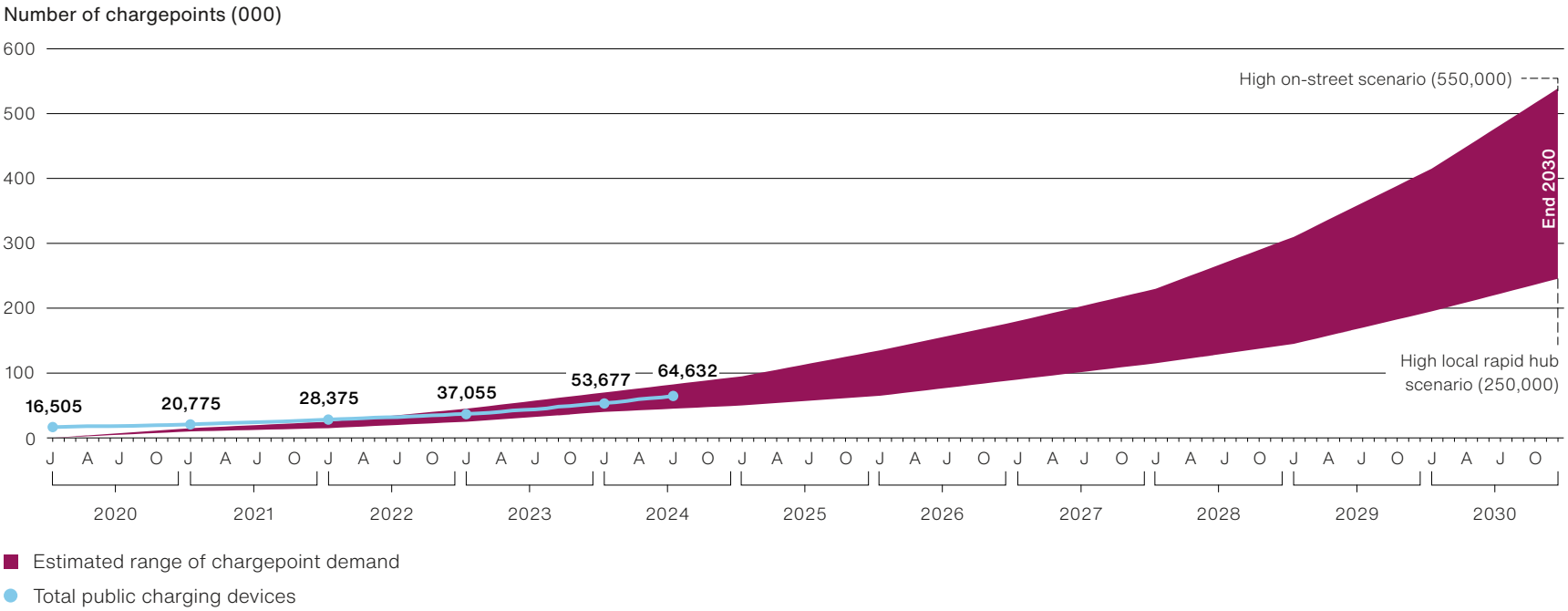
- Address barriers to private sector rollout
- Regulate to improve confidence in the public network
- Work with Ofgem to integrate chargepoints with the energy system
- Government support for innovation in business models and technology

Source: National Audit Office summary of the Department for Transport's *Taking charge: the electric vehicle infrastructure strategy*

Figure 3

Chargepoint rollout in the United Kingdom as at July 2024 against the Department for Transport's (DfT's) chargepoint demand estimates

As of July 2024, there were 64,632 chargepoints installed, which is in line with DfT's chargepoint demand estimates



Notes

1 'High on-street scenario' refers to the estimated number of chargepoints needed where drivers have a greater preference for using low-powered chargepoints near their homes. 'High local rapid hub scenario' refers to the estimated number of chargepoints needed where drivers have a greater preference for using higher-powered rapid chargepoints near their homes. DfT have maintained 300,000 chargepoints as their estimate of the minimum number needed by the end of 2030.

2 DfT periodically refreshes their demand estimates – this shows their latest analysis at the time of our publication.

Source: National Audit Office analysis of data from the Department for Transport, including chargepoint installation numbers provided by Zapmap. Available at: www.zap-map.com

1.11 The precise number of public chargepoints that will be needed by 2030 is highly uncertain. It depends on several assumptions such as vehicle mileage and the location of chargepoints and how quickly they charge a vehicle. If people prefer rapid chargepoints over low-powered ones, fewer chargepoints are needed to recharge vehicles. DfT's estimate of needing a minimum of 300,000 public chargepoints reflected charging behaviour when the strategy was published, and represented an estimated demand, depending on different scenarios, of 280,000 to 720,000 public chargepoints. DfT periodically refreshes its modelling of potential future demand for public chargepoints. The mix of rapid and slow chargepoints has proceeded broadly in line with expectations to date, though with a higher proportion of rapid chargepoints than estimated previously. It currently estimates that the demand for public chargepoints in 2030 will be in the range 250,000 to 550,000.

1.12 The location of public chargepoints to date has been influenced by early adopters of electric vehicles. This has resulted in around 44% of public chargepoints across the UK being located in London and the South East, with London having more than twice as many chargepoints per capita than any other region (**Figure 4** on pages 20 and 21). Only around 15% of chargepoints in England are in rural areas. DfT has interventions intended to support a more even spread of public chargepoints, which we cover in Part Two. DfT has no specific target related to how public chargepoints are distributed across different regions and across urban and rural areas. DfT's estimated minimum number of public chargepoints needed by 2030 could be met without achieving the spread of chargepoints needed for a well-functioning network.

1.13 Progress in Scotland, Wales and Northern Ireland, where transport is devolved, is not controlled by DfT. Ensuring a UK network develops that meets the need of the public requires alignment across the administrations. To date, while different approaches have been taken, the strategic intent across the UK has been broadly aligned.

Figure 4

Map of the number of chargepoints across the United Kingdom by 100,000 population as at July 2024

Chargepoints are distributed unevenly throughout the UK, with London having more than twice as many chargepoints per 100,000 population than any other region

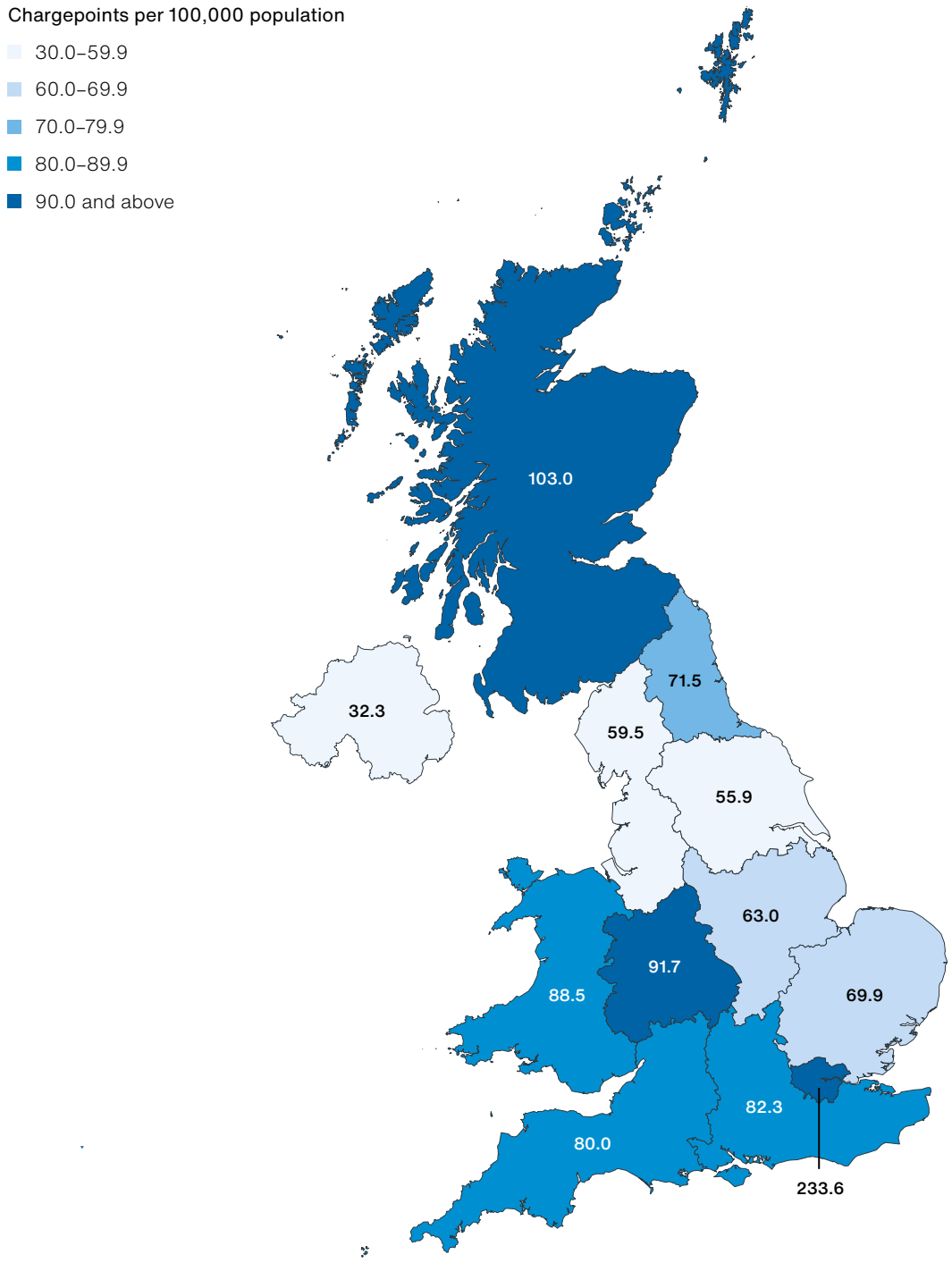


Figure 4 *continued*
Map of the number of chargepoints across the United Kingdom by 100,000 population as at July 2024

Notes

1 This map depicts the number of chargepoints per region, as reported in the Department for Transport's Electric Vehicle Public Charging Infrastructure Statistics: July 2024, Annex A. Data relating to the number of chargepoints installed was provided by Zapmap, who report they have coverage of over 95% of the network, meaning total numbers may be higher.

2 Chargepoint numbers refer to public, open access charging devices that are usable without a need for a specific make of vehicle. Devices may offer one or multiple connecting sockets.

Source: National Audit Office analysis of data provided by Zapmap to the Department for Transport. Available at: www.zap-map.com. Office for National Statistics licensed under the Open Government Licence v.3.0. Contains OS data © Crown copyright and database right 2023

Progress against the commitments in the electric vehicle infrastructure strategy

1.14 DfT's electric vehicle infrastructure strategy contains 38 commitments intended to help deliver its 2030 vision. At the time it was published in 2022, there were only 29,600 chargepoints, and the strategy aimed to support the acceleration of installations. Over 75% of its commitments were expected to be complete within one year, as they were intended to lay the groundwork ahead of a period of rapid growth. Two years on from its strategy, 84% of the commitments have been carried out (**Figure 5** overleaf). DfT's two key interventions to support the growth of public chargepoints – in local charging and rapid charging on the strategic road network are ongoing (see Part Two).

1.15 DfT will need to assess what actions it needs to take to support a more mature chargepoint market and a greater number of people using it. This may require more targeted interventions in order to address challenging areas that its existing programmes prove unable to address. DfT also plans to build on early work to understand how to support the decarbonisation of other vehicle types, particularly heavy goods vehicles (HGVs). DfT has started a demonstrator programme to examine the performance of battery electric and hydrogen fuel cell HGVs under real-world conditions and encourage future commercial investment in these technologies.

Figure 5

The Department for Transport's (DfT's) progress against its commitments in the electric vehicle infrastructure strategy action plan (2022) as at October 2024

DfT has implemented 84% of the commitments since its strategy was published in 2022

Action plan timings and progress		
Total	Complete	Incomplete
38 commitments in DfT's electric vehicle infrastructure strategy (2022)	**32** (84%)	**6** (16%)

Action plan commitments by theme			
Support the rollout of rapid chargepoints	Total	Complete	Incomplete
	3	2	1
Actions include consulting on the design of the rapid charging fund; piloting projects; and ensuring there are at least six high-powered chargepoints at each motorway service area by the end of 2023.			
Support local government to develop chargepoint strategies and scale-up rollout of public chargepoints	Total	Complete	Incomplete
	14	11	3
Actions include expanding the On-street Residential Chargepoint Scheme; supporting local authorities through the Local Electric Vehicle Infrastructure (LEVI) fund and the Local Government Support Programme; and launching a local government knowledge hub, a Crown Commercial Services framework, a Local Authority Toolkit to reduce transport emissions, and an EV infrastructure guide for local authorities.			
Address barriers to private sector rollout	Total	Complete	Incomplete
	9	8	1
Actions include exploring options to reduce barriers in the planning system; developing best practice guidance for local authorities when issuing licences to install chargepoints; and consulting on measures to make the process to install on-street chargepoints more straightforward.			
Regulate public chargepoints market	Total	Complete	Incomplete
	5	4	1
Actions include publishing the Public Charge Point Regulations 2023; developing charging accessibility standards; and publishing the government response to the Future of Transport Regulatory Review proposals.			
Work with Ofgem to make sure chargepoints are easy to connect to and integrate with the electricity system	Total	Complete	Incomplete
	7	7	0
Actions include regulations to mandate smart private chargepoints that meet minimum requirements; consulting on how to make the shift to smart charging in public infrastructure; and publishing an electricity networks strategic framework and a smart charging action plan.			

Source: National Audit Office analysis of Department for Transport data

Part Two

Progress with support for local charging and rapid charging on the strategic road network

2.1 Most chargepoint investment has been led by the private sector. The Department for Transport (DfT) has identified two key areas that require government intervention. This part assesses progress with the rollout of:

- local chargepoints, through the Local Electric Vehicle Infrastructure (LEVI) programme;
- rapid and ultra-rapid chargepoints on the strategic road network, including interventions such as the rapid charging fund (RCF); and
- DfT's progress in addressing wider barriers to chargepoint rollout.

Local chargepoints – local electric vehicle infrastructure (LEVI) programme

2.2 Most people want to charge their vehicles near their homes. For those without driveways or garages (around 32% of homes), or the ability to install a cross-pavement cable from their home, there is a need for local public chargepoints located on the street or in local car parks.

2.3 DfT established the local electric vehicle infrastructure (LEVI) programme to address the slow and regionally variable development of the market for local chargepoints. An overview of the LEVI programme is shown in **Figure 6** overleaf.

2.4 This section assesses DfT's progress in:

- supporting local authorities to develop plans for public chargepoints; and
- implementing plans for local public chargepoints.

Figure 6

The Local Electric Vehicle Infrastructure (LEVI) programme

LEVI is a £450 million programme allocated between 2022-23 and 2024-25 that aims to support the installation of local public chargepoints and improve the spread of where they are located

Programme description	The three-year programme launched in March 2022. It aims to provide funding to projects in each local authority to part-subsidise the cost of chargepoint installations, with the remainder provided by local authorities and private investment.
Key objectives	Deliver a step-change in the deployment of local, primarily low-power charging infrastructure across England. Accelerate the commercialisation of, and investment in, the local charging infrastructure sector.
Funding	£400 million of capital spending to procure chargepoints. £50 million resource spending to improve the capability and capacity of local authorities to build chargepoint networks.
Fund Structure	The Department for Transport (DfT) intended to fund Tier 1 local authorities in two main tranches over two years from 2023-24:[1] Tranche 1 in 2023-24 and Tranche 2 in 2024-25. This followed an initial set of pilot projects. Some of the projects initially in Tranche 1 have been deferred to Tranche 2. Funding is allocated based on need, for which local authorities develop projects for approval by DfT, and is released as local authorities meet certain milestones.
Progress	• LEVI Pilot: As of July 2024, 10 out of 26 projects are in delivery. • Tranche 1 projects: As of October 2024, nine of the 44 projects have been approved to go to delivery. None have completed procurement. • Tranche 1 deferred and Tranche 2 projects: As of October 2024, 32 of 34 projects have been submitted for assessment, with one approved to go to delivery. • As of October 2024, DfT has spent £32 million on the LEVI pilot and £210 million on the main LEVI tranches (including £40 million of capability funding).

Note

1 Tier 1 local authorities consist of 46 unitary authorities, 10 combined authorities, 24 county councils, and all London boroughs as one aggregated unit, totalling 81 local authorities when the fund launched.

Source: National Audit Office analysis of Department for Transport documents

Supporting local authorities to develop their plans for public chargepoints

2.5 In designing the LEVI programme, DfT learned lessons from previous grant schemes. From 2017 to 2024, DfT ran the £84 million on-street residential charging scheme to support local authorities across the UK with local charging. When we last reported, uptake of the scheme was slow, with around one-third of the programme budget allocated up to that time unspent. Local authorities told us that the scheme had been designed with insufficient consultation and, as a result, it was difficult to bid for, and ultimately not all local authorities applied for the scheme. Grants were issued on a first-come first-serve basis, meaning funding did not necessarily go where it was most needed.

2.6 DfT made three key design choices for the LEVI programme, drawing on lessons learned.

- **Approach to funding:** Rather than have local authorities compete for funding through bids, it was allocated to local authorities based on factors such as the number of existing chargepoints and the amount of off-street parking, to better match funding to where it is needed.
- **Capability building:** Funding has been provided specifically to build the capability of local authorities to plan local charging infrastructure. As of October 2024, this funding has supported 216 full-time officer roles, of whom 158 are in post.
- **Central support and expertise:** DfT set up a LEVI support body, to help local authorities produce applications and to provide specialist technical and commercial expertise. The support body is a consortium of three private companies: the Energy Saving Trust, Cenex, and PA Consulting.

2.7 All eligible local authorities have engaged with the LEVI programme, which has increased the number which have a local electric vehicle charging strategy; as of October 2024, DfT identified that around half of local authorities have developed a strategy, with others in the process of doing so.

2.8 DfT currently forecasts that LEVI will support the installation of more than 100,000 chargepoints, which would achieve the programme's objective to support the growth of the local chargepoint industry.

Implementing plans for local chargepoints

2.9 The speed at which DfT intends the LEVI programme to deliver has placed pressure on local authorities. Its three-year duration has required local authorities to build their capability to plan and deliver chargepoint infrastructure alongside planning the work they will fund. As a result, developing projects to DfT's standards has taken longer than it expected. In January 2024, DfT had returned 35 of the 55 applications it had first assessed back to local authorities to amend and resubmit their plans, finding more issues than it originally anticipated. Many local authorities were also intending to use a procurement route which was determined late on in the programme to be infeasible under procurement regulations, requiring some local authorities to rework their plans. Collectively, these issues have led to delays for local authorities; as of October 2024, while virtually all local authorities had developed projects and were in the process of refining these, only 10 projects had been approved to go to delivery against a final approval deadline of March 2025.

2.10 DfT designed the LEVI programme so local authorities would be going to the market in two phases. The gap between these phases has shrunk following the delays local authorities have experienced on the first tranche of the programme. This has led to concerns among industry and local government that too many local authorities will be procuring at similar times. This might lead to failed procurement as operators focus on the more profitable opportunities. DfT has assessed that intervening to direct when local authorities go to market to ensure that each attracts sufficient interest might be counterproductive, as there are many external factors which affect when local authorities are able to start procurements.

2.11 Local authorities who piloted the LEVI programme are reporting delays to completion. Of the 26 pilot projects, 13 are delayed by a year or more, with a further three delayed by less than a year. Local authorities have reported issues such as a lack of resource, processing planning permissions, practical problems with the sites selected, and wider supply chain issues. These issues are likely to be experienced by projects delivered through the main fund.

2.12 DfT intends to issue all capital, central support body and capability funding by March 2025, meaning, without further funding, local authorities will have to deliver their projects without further central support. DfT will need to determine how it will support these projects if it is not able to confirm funding beyond March 2025. DfT will also need to consider how it maintains the knowledge and capability developed by the programme in future, for use by local authorities in deploying chargepoints after their LEVI projects finish. The government recently allocated £200 million to support charging infrastructure at the 2024 Budget, including local charging, but DfT has not yet finalised how it will spend this money.

Rapid charging on the strategic road network

2.13 One of the key barriers to electric vehicle uptake is 'range anxiety', or the concern that a vehicle will not be able to obtain enough charge to complete a long journey. A network of rapid chargepoints along motorways and A-roads (collectively known as the 'strategic road network') is key to addressing this.

2.14 In 2020, the government announced its vision for a rapid chargepoint network, setting out the following ambitions.

- By 2023, to have at least six ultra-rapid chargepoints at motorway service areas in England, with some larger sites having as many as 10 to 12.[8,9] These are key locations for drivers as they provide other facilities, and the visible presence of chargepoints can provide confidence to those considering switching to an electric vehicle.
- By 2030, for there to be 2,500 ultra-rapid chargepoints across England's strategic road network, rising to 6,000 by 2035.

To achieve this, DfT set up Project Rapid, of which the rapid charging fund is the most significant part (**Figure 7** overleaf).

2.15 This section examines progress with:

- increasing the number of rapid chargepoints on the strategic road network; and
- removing barriers to electricity connections at motorway services areas.

Increasing the number of rapid and ultra-rapid chargepoints on the strategic road network

2.16 As of July 2024, there were 2,377 ultra-rapid chargepoints within one mile of the strategic road network.[10] There were also a further 2,220 rapid chargepoints (between 50 and 149kW) within one mile of the strategic road network which were installed in responses to consumer demand for rapid chargepoints that has emerged since the government set out its vision. These comprise an increase of around 230% from the 1,392 rapid and ultra-rapid chargepoints that were available in January 2022.[11] These increases have been in response to demand from vehicle owners, exceeding DfT's initial expectations, and have not required government funding.

8 These aims were expressed as "high-powered chargepoints" at the time of the announcement, however this terminology is no longer used, so we have used DfT's current equivalents. Ultra-rapid (150kW+) chargepoints will charge most vehicles from 20% to 80% within 30 minutes under ideal conditions, and rapid chargepoints (50kW) within 60 minutes. The time taken to charge a vehicle depends on the size of its battery and the chargepoint speed.

9 Motorway service areas are designated rest areas on the motorway network, owned by private operators and regulated by DfT.

10 All numbers quoted refer to public, open access chargepoints that are usable without a need for a specific make of vehicle. Devices may offer one or multiple connecting sockets. Except where otherwise stated, data on chargepoint numbers is provided by Zapmap (www.zap-map.com), who report they have coverage of over 95% of the network, meaning total numbers may be higher.

11 In January 2022, DfT's definition of "rapid" encompassed all chargepoints at 25kW or higher, meaning the number rated at 50kW or higher may have been lower.

Figure 7
Project Rapid and the rapid charging fund

Project Rapid is the Department for Transport's (DfT's) programme of work to ensure fast and reliable chargepoints are available for longer journeys

Programme description	Installing rapid chargepoints on the strategic road network can be too expensive for industry to take on. This is because of the time and cost needed to connect to and reinforce the electricity network at remote locations. These connections can take between 18 months and four years to construct, and cost millions of pounds each. The rapid charging fund is designed to accelerate private sector investment by removing barriers relating to connecting to the electricity grid. The programme aims to fund a portion of the costs of upgrading the electricity grid at key locations, where it is it prohibitively expensive for the private sector to do so.
Programme objectives	• Short-term early interventions work to support the private sector in ensuring there are at least six ultra-rapid chargepoints (150kW+) at every motorway service area in England by the end of 2023.[1] DfT uses six chargepoints as a benchmark for a reasonable level of provision to give drivers confidence in charging infrastructure. Longer-term interventions through the rapid charging fund: • Future-proof electricity connections at strategic locations such as motorway service stations, so that chargepoint numbers can expand quickly, supporting DfT's overall aims for 2,500 ultra-rapid chargepoints by 2030 and 6,000 by 2035.[2] • Support the wider strategic road network to ensure electricity capacity is not a constraint in the longer-term rollout of rapid charging.
Funding	£950 million announced for the rapid charging fund. At the time of publication, no funding had been disbursed.
Current status	Around half of motorway service areas met DfT's ambition to each have six ultra-rapid chargepoints by 2023, increasing to 62% by July 2024. The rapid charging fund was announced in 2020. DfT initially intended to pilot the fund in winter 2022 before a full launch in 2023. DfT opened the pilot for applications in December 2023, with six pilot applications currently being appraised by DfT. DfT is assessing its options for how it will intervene further on the strategic road network, based on learning from the pilot.

Notes

1 Ultra-rapid (150kW+) chargepoints will charge most vehicles from 20% to 80% within 30 minutes under ideal conditions, and rapid chargepoints (50kW to 149kW) within 60 minutes.

2 The government's vision for the strategic road network announced in 2020 referred to ultra-rapid (150kW+) chargepoints as 'high powered chargepoints'.

Source: National Audit Office analysis of Department for Transport documents

2.17 However, there are stretches of major A-road where there are currently not enough rapid and ultra-rapid chargepoints. There are stretches of major A-roads in the South West, West and the North where a vehicle with only 10% of its battery remaining would not be able to reach a site with at least six rapid or ultra-rapid devices (see **Figure 8** overleaf). DfT is examining whether existing gaps on major A-roads are likely to be addressed, and the nature of the challenges with sites that currently lack provision, to determine whether and how it may need to intervene in future.

Removing barriers to electricity connections at motorway service areas

2.18 In 2020, the government announced an aim for there to be six ultra-rapid chargepoints at each of the 114 motorway service areas by 2023. DfT anticipated that the private sector would be able achieve this ambition, and did not have a good understanding of the barriers that would prevent it being achieved, such as the cost and time needed for even modest electricity grid upgrades. DfT did not allocate funding for this aim, and as barriers became more apparent, DfT engaged with the operators of motorway service areas to encourage them to install chargepoints, assist them in requesting grid connections and also make use of other public sector schemes to improve electricity capacity. These included Ofgem's Green Recovery Scheme and a National Highways battery storage project. At the end of 2023 around half of motorway service areas reported they had at least six ultra-rapid chargepoints, increasing to 62% by July 2024. DfT currently anticipates that around 100 sites will meet the target by July 2025.[12] Including rapid and ultra-rapid chargepoints (all those at 50kW and above), there are an average of eight public chargepoints per motorway service area (965 in total, of which 775 are ultra-rapid), but significant variation between different locations. Some have over 50 rapid chargepoints (though not all of these are open access) and two sites have none, with provision highest in the Southeast.

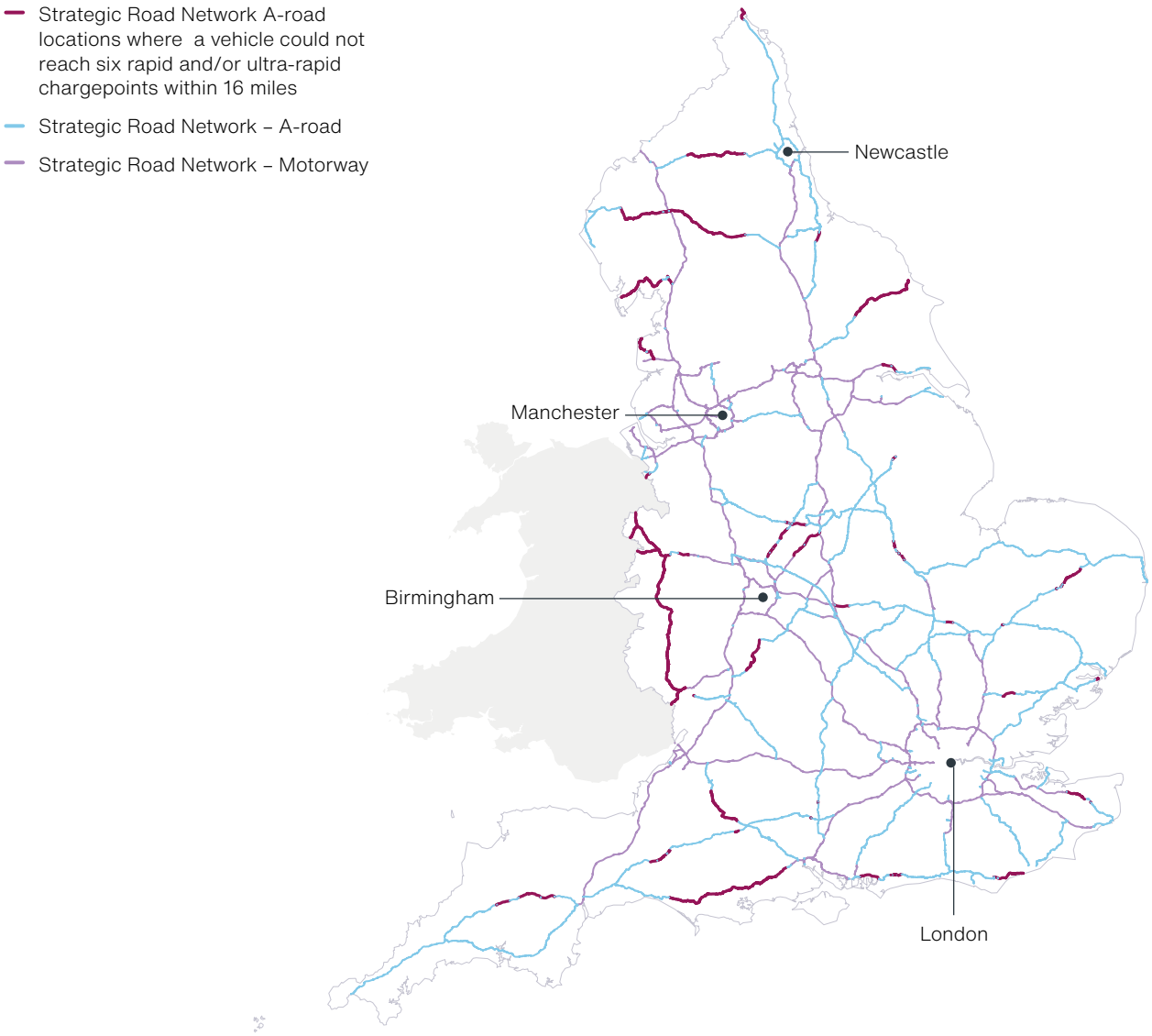
2.19 For the longer-term, DfT established the rapid charging fund to help future-proof electricity connections along the strategic road network. Many motorway service areas are in locations that do not have the current or future level of electricity capacity needed. Addressing this can cost millions of pounds and take between 18 months and four years to put in place. This makes the installation of chargepoints commercially unviable without government intervention. Forecast demand differs at different sites, with initial DfT estimates indicating that, at July 2024, only around 10% of motorway service areas had the power capacity they would need to meet rapid chargepoint demand to at least 2035. Of the remainder, around half may need to increase their capacity by two to 10 times, and some sites may need to increase their capacity even more.

12 Numbers of chargepoints at motorway service areas are reported by survey from owners to DfT. These numbers may use different technical definitions of what counts as a charging device and so may not be directly comparable to other numbers used in this report.

Figure 8

Rapid and ultra-rapid charging provision on A-roads on the strategic road network in England in July 2024

While the provision of rapid and ultra-rapid chargepoints across the strategic road network has grown substantially since 2022, there remain stretches of major A-road where provision may not be enough to reliably support drivers on longer journeys



Notes

1 The map displays Department for Transport (DfT) analysis of charging device locations, and a routing algorithm that calculates the driving distance between road nodes and charging devices.

2 This analysis only looks at points on strategic road network A-roads; Motorways and local A-roads are not analysed.

3 16 miles is based on the remaining range for an average van in 2024 with 10% remaining battery capacity. The range for an average car is 21 miles, but the Department for Transport models vans as a more challenging scenario to measure against. Note some locations may only apply for vans.

4 The map uses Zapmap data on charging devices as of 1 July 2024 and includes closed-access chargepoints that can only be used by certain types of vehicles.

5 The analysis is based on routes and is directional. A location where chargepoints could not be reached may appear on one side of a carriageway even if there are chargepoints on the opposite carriageway.

Source: National Audit Office map displaying Department for Transport analysis of data provided by Zapmap. Available at: www.zap-map.com.

2.20 DfT had not fully developed the rapid charging fund when it was announced in 2020 and has had to build its understanding of how to address the problem. DfT initially anticipated piloting the fund in winter 2022 before a full launch in 2023. It has since only opened the pilot for applications in December 2023, and is currently assessing these. Industry stakeholders have expressed frustration at how long it has taken to get this intervention up and running. DfT has redesigned and pushed back its pilot largely due to the following factors.

- **Regulatory change in the energy sector:** Initially, operators of motorway services areas would have borne high costs for upgrading capacity before it was in use. In response, DfT secured changes with Ofgem and grid operators to resolve this.
- **Addressing existing competition concerns within the sector:** Some operators of motorway service areas have exclusivity arrangements with existing chargepoint operators or have sought to become chargepoint operators themselves. This means the policy needs to be designed to ensure that localised monopolies are not created which would be detrimental to consumers.
- **Risk of legal challenge:** Providing funds to motorway service areas to facilitate chargepoint rollout could disadvantage other market participants which have done so without government intervention, opening DfT to legal challenge. DfT has had to redesign its intervention in response to stakeholder views, and advice it sought from the Competition and Markets Authority to ensure that it does not distort market competition in the sector.

2.21 The operators of motorway service areas have not typically invested in large energy infrastructure projects, applied for government grant funding, or needed to request major electricity connections upgrades from electricity network operators. DfT has engaged with the sector to build operators' capability and improve their relationships with electricity network operators.

2.22 Since the government committed to the rapid charging fund, aspects of its case for intervening have changed, particularly the degree of market interest in rapid charging on the strategic road network. DfT is now considering its learning from the pilot and is assessing its options for how it intervenes further on the strategic road network, such as proceeding with further grant funding and/or using other means of incentivising network connections. However, further delays to the delivery of network capacity risk it not being in place at some sites to support charging demand when needed.

Addressing barriers to installation

2.23 This section examines the actions that DfT and other government bodies have taken to address wider barriers to the installation of public chargepoints. These largely relate to planning permission and electricity connections, which DfT identified in its electric vehicle infrastructure strategy as causing expense and delay.

Planning permissions

2.24 Installing a chargepoint requires engagement with many different bodies, including national and local planning authorities, landowners and electricity network operators. Processes were not designed with chargepoint operators in mind, meaning they can cost more and take longer to complete.

2.25 DfT has worked with industry to identify where planning processes can be amended or streamlined (**Figure 9**). It has started work to address these and has also contributed to wider reforms owned by other government departments. In the first instance, government's solutions have typically involved issuing guidance or bringing together stakeholders to simplify and align process requirements. In other instances, such as highway consents and gaining landowner permissions for development access, more fundamental reform is being considered to make it easier for chargepoint operators and other users to secure the permissions needed. As the volume of chargepoint installations increases, these issues may become more significant if they remain unresolved, but DfT does not know by how much. For example, planning authorities and other bodies may struggle to process applications as the volumes increase.

Electricity connections

2.26 The government recognises that the process to receive electricity grid connections is no longer fit for purpose. There are increasing numbers of connection requests and connections are increasingly requested before a project is ready for them. This has meant that customers can wait many months for a connection, and potentially several years where the grid needs substantial capacity upgrades to support the increased supply and/or demand.

2.27 These issues mainly affect rapid charging sites, which require large amounts of power, and often need upgrades to the high-voltage network that transfers power from generation sites. However, these issues can affect other charging sites where the local electricity grid does not have the capacity to service increased demand. Processes for requesting connections at the local level differ between local grid operators, making them complex for chargepoint operators to use.

2.28 In 2023, the Department for Energy Security & Net Zero and Ofgem put in place a Connections Action Plan, which contains a series of actions intended to improve issues with electricity grid connections ahead of more fundamental reform in future, such as amending the previous 'first-come first-served' queue system, so that projects that are not ready for connection do not hold up others. As part of this plan, a new connections process is planned to be implemented in 2025. Ofgem are also consulting on further improvements through their end-to-end review of the connections process. To date, there have been improvements in the rate at which connections are made, but the connections queue is still growing. DfT also separately brought together chargepoint and electricity network operators to develop further actions for speeding up chargepoint connections specifically.

Figure 9

Barriers in the planning processes for public chargepoints

Planning processes were not created with electric vehicle chargepoint installation in mind, introducing additional complexity, time and cost

Issue	What the government is doing
Highway consents	
Installing a chargepoint on a public highway requires a section 50 licence. These take an average of three months to be issued, costing between £500 and £1,000, with a separate licence needed for each site. There is no standard process and requirements differ between local authorities.	The Department for Transport (DfT) has issued guidance to improve the consistency in application processes and reduce application times. DfT is considering including chargepoint operators in the same permits process for streetworks as utility and telecom providers. This follows a consistent process, has lower fees (up to £130) and would reduce processing times to a few days.
Gaining access to a third party's land	
Where changes or additions to electricity grid infrastructure are needed, permission (a wayleave) may be needed from a third-party landowner. Securing wayleaves is complicated and processes differ for each local grid operator. In some instances, the landowner does not cooperate, meaning an application to the Secretary of State for Energy Security and Net Zero is required, which can make the overall process take nine to 18 months.	The Department for Energy Security & Net Zero (DESNZ) ran a call for evidence in 2022 to determine whether changes were required to the wayleaves process. In response to this, DESNZ told us it intends to consult on changes to improve the clarity and speed of the wayleaves process in 2025. It has set out some interim measures, such as establishing a working group, and updating guidance to clarify expectations and understanding between developers, landowners and grid operators.
Development rights	
Planning permission may be need for some site types, which can require 12 weeks to secure. This can affect some private installations as well, as typically planning permission is needed for installation of apparatus within two metres of a public highway.	Operators are now allowed to install chargepoints on behalf of local authorities on their land without a requirement for planning permission, though this is still needed on private land. The Ministry of Housing, Communities & Local Government has consulted on removing the two-metre rule for private chargepoints. Building regulations have also been amended so that provision for chargepoints is included in new homes as standard.
Traffic Regulation Orders	
Dedicated parking bays for electric vehicles require a Traffic Regulation Order. This is a paper-based process, taking six to 12 weeks, with application costs from £600. There is no standard process and requirements differ between local authorities.	DfT is introducing a digital system with a standardised process which will reduce the application time to a couple of weeks. DfT is also carrying out a review to remove the need for Traffic Regulation Orders for chargepoints, though this could take until 2026 to implement.

Note

1 This is not an exhaustive account of all processes and permissions required for chargepoint installation, and lists only key processes identified by government and industry as requiring further consideration.

Source: National Audit Office summary of Department for Transport and Department for Energy Security & Net Zero documents

Part Three

Improving user experience of using public chargepoints

3.1 The Department for Transport (DfT) has recognised that using public chargepoints is not always straightforward or reliable. DfT has set out to improve customer experience and confidence. This part examines:

- DfT's regulatory approach to improve the consumer experience of chargepoints; and
- DfT's approach to improve the accessibility of charging infrastructure for disabled users.

Regulating to improve consumer experience

3.2 The installation and operation of public chargepoints is a fast-growing market. Without guidance and regulation there is a risk that the public charging network develops in a way that does not achieve the outcomes DfT is seeking to achieve.

3.3 In 2021, DfT consulted on user experience of public chargepoints, ahead of developing regulations for the sector. DfT identified that the use of public chargepoints in practice was becoming too complex. Issues included the need to use different smartphone payment apps for different operators, unclear pricing, and public concern about the reliability of chargepoints. DfT's consultation focused on four areas.

- Making it easier to locate available public chargepoints.
- Making it easier to pay at a public chargepoint.
- Making prices for charging clearer and easier to compare.
- Improving the reliability of charging.

In 2023, Parliament approved regulations for public chargepoints in these areas (**Figure 10**).

Figure 10

Summary of Public Charge Point Regulations 2023

The Department for Transport (DfT) has introduced regulations to improve customer experience of public chargepoints. The regulations will be monitored by DfT and the Office for Product Safety and Standards (OPSS)

Area of regulation	Summary of requirements	Date regulations came into force	How the government will monitor compliance
Making it easier to locate available public chargepoints			
Open data	Chargepoint operators must make data available, including location, charging connection type, payment methods and any time restrictions. They must also provide live data on pricing and whether the charge point is working and available to use.	November 2024	Ongoing monitoring by OPSS.
Making it easier to pay at a public chargepoint			
Payment method	New public 'fast' chargepoints and existing 'rapid' chargepoints must offer contactless payments to consumers.[1] Around 60% of public chargepoints are 'slow' chargepoints – such as chargepoints in lamp-posts – where DfT has assessed that adding contactless payment will not be commercially feasible.	November 2024	Ongoing monitoring by OPSS.
Roaming[2]	Chargepoint operators must enable consumers to pay through at least one roaming provider at their chargepoints. In practice, this means that people will be able to use more than one single smartphone app or card.	November 2025	Chargepoint operators must report to DfT and OPSS from December 2023 outlining the arrangements put in place, and update DfT within 28 days of any future changes.
Helpline	A free-to-use helpline must be available and advertised at all chargepoints. The helpline must be staffed all day, every day.	November 2024	Chargepoint operators must report every three months to DfT and OPSS on the number and reasons for calls, and how long the issue took to resolve.
Making prices for charging clearer and easier to compare			
Pricing metric	The maximum price of a charging session must be displayed clearly in pence per kilowatt hour.	November 2023	Ongoing monitoring by OPSS.
Improving the reliability of charging			
Reliability	'Rapid' charge points must be 99% reliable, measured as an average across each chargepoint operator's rapid network. Information on reliability compliance must be published on the chargepoint operator's website.	November 2024	Chargepoint operators must report their reliability data on at least an annual basis and must publish information on their website.

Notes

1 There is no common naming convention for the speed categories of charging devices. DfT is working with industry to agree a naming convention. DfT categorises these as follows: slow chargepoints have a charging speed category of 3 kilowatts (kW) up to 8kW, fast chargepoints are between 8kW and 49kW, while rapid chargepoints are 50kW and above.

2 Roaming is the ability to pay to charge an EV across multiple charge point networks using a single app or RFID (Radio Frequency Identification) card. The equivalent for petrol and diesel vehicles is a fuel card.

Source: National Audit Office summary of Department for Transport, *Public Charge Point Regulations 2023 guidance*. Available at: www.gov.uk/government/publications/the-public-charge-point-regulations-2023-guidance/public-charge-point-regulations-2023-guidance

3.4 The regulations include measures intended to address concerns that public chargepoints are not reliable enough. They specify that, from November 2024, operators must ensure that their rapid chargepoints are available for use 99% of the time (excluding factors outside of operators' control). Based on industry data, the overall reliability of rapid chargepoints for 2023-24 was estimated to be 97%, close to the 99% required for individual networks from November 2024.[13] Within this average figure, the reliability of individual operators' networks will vary. A snapshot of data from August 2024 on individual chargepoint operators suggests that only 79% of operators were achieving 99% reliability across their rapid chargepoints (**Figure 11**).[14] There is also the potential for variability between different locations, which may cause localised poor reliability to emerge, particularly in remote areas. DfT will need to monitor how reliability compliance is distributed and determine whether more targeted intervention is required. The reliability of chargepoints slower than 50kW was estimated to be 99% for 2023-24 though these are not included within the reliability regulation. While this appears higher than rapid chargepoints, it can take longer for slower chargepoints to be reported as unavailable where these are used less frequently, affecting the recorded reliability.

3.5 It is too early to say if the regulations will work as intended, which will also be determined by levels of compliance and how they are monitored and enforced. The Office for Product Safety and Standards (OPSS) is responsible for taking enforcement action.[15] Enforcement activity should influence levels of compliance; OPSS can instruct chargepoint operators to bring their performance up to the standards in the regulations by a particular date and can issue fines or stop operators installing new chargepoints until performance improves.

3.6 DfT will need to monitor how the regulations are working in practice and whether amendments or other solutions are required. For example, events outside of operators' control which result in chargepoints not being available are excluded from the reliability averages but still impact on the availability to drivers. Issues may also emerge with how operators respond in different locations, such as those where chargepoint use is less profitable. DfT has also commissioned research, expected to conclude in early 2025, to refresh its understanding of consumer issues and behaviour, and inform its future approach.

13 Reliability data provided by Zapmap (www.zap-map.com) based on statuses reported by around 70% of the UK's chargepoint network.

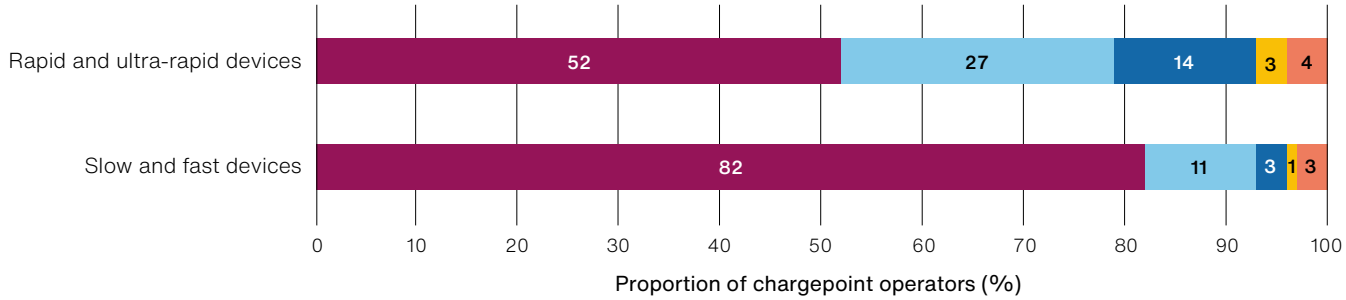
14 These data do not fully take into account the legal exemptions from the reliability metric which chargepoint operators can use, such as factors outside of their control. Compliance is likely to be higher once those exemptions are included in the calculations.

15 OPSS is part of the Department for Business and Trade. OPSS can issue fines related to chargepoint regulations of up to £10,000 per chargepoint in breach, except on reliability, where it is £10,000 per operator whose network fails to meet 99% reliability.

Figure 11

The reliability of public chargepoint networks as at August 2024

The average reliability of rapid chargepoint networks, as at August 2024, is lower than for slower chargepoints, with 79% of chargepoint operators achieving the 99% reliability required from November 2024



Percentage of time chargepoints are working on average across an operator's network

- 100% reliability
- 99% < 100% reliability
- 90% < 99% reliability
- 80% < 90% reliability
- Lower than 80% reliability

Notes

1 Snapshot of reliability data as at August 2024 reflecting statuses reported by around 70% of the UK's chargepoint network. Broadly indicative of reliability recorded over 12 months.

2 Rapid and ultra-rapid devices are those with a power rating of 50kW and above, and slow and fast devices are those with a power rating less than 50kW.

3 This graph presents data on reliability of public charging devices, collected by Zapmap. It does not reflect the reliability of chargepoints as calculated under the Public Charge Point Regulations 2023. For example, these regulations provide exemptions for specific events such as planned routine maintenance.

4 Under the Public Charge Point Regulations 2023, from November 2024, each chargepoint operator's network of rapid and ultra-rapid chargepoints must be, on average, 99% reliable across the year.

5 The reliability requirements within the Public Charge Point Regulations 2023 do not apply to slow and fast chargepoints. Slower chargepoints may typically be used less frequently than rapid chargepoints and could be unavailable for longer before this is reported, which may affect the recorded reliability.

Source: National Audit Office analysis of data provided by Zapmap to the Department for Transport. Available at: www.zap-map.com

3.7 The chargepoint market is expected to grow significantly. As it does, DfT will need to adjust its approach to how it monitors the sector to protect consumers from emerging risks. For example, the potential exists for excess profits to be made through local monopolies or other unfair practices, which monitoring of prices could help identify. Similarly, as the market matures, arrangements for provider failure may be needed if chargepoint operators fail and their network of chargepoints is not taken over by other operators.

3.8 DfT expects that most people will charge vehicles at home using private chargepoints, but people who are solely reliant on public chargepoints pay more to power their vehicles. The cost of public charging reflects aspects such as the wholesale price of electricity, chargepoint operator profit margins, and the difference between the value added tax charged on electricity from private (5%) and public chargepoints (20%). This means that a driver using a 'slow' home chargepoint will spend around £10 charging their vehicle, whereas those using a public 'slow' chargepoint will spend around £20. Should a driver use a public rapid chargepoint, it could cost around £30 to charge their vehicle.[16] In future, price transparency may act as an incentive to lower the cost of charging, and opportunities may also emerge through measures such as smart charging and the transfer of energy from vehicles back to the grid at times of peak demand. However, the government will also need to assess whether the overall balance of incentives supports consumers reliant on public chargepoints, and whether any aspects may require further regulation.

Accessibility

3.9 DfT has recognised the importance of ensuring that public chargepoints are accessible to drivers with disabilities. By 2035, 1.35 million drivers with disabilities are expected to be partially or wholly reliant on public chargepoints. DfT's Inclusive Transport Strategy (2018) identified concerns with access to chargepoints and the need for these to be accessible for all transport users. It pointed to existing legislation under the Equality Act 2010 as being applicable to the provision of chargepoints. DfT's inclusive mobility best practice guide (in 2021) also highlights key principles in the creation of accessible transport.

3.10 The public chargepoint network as a whole is not currently accessible to drivers with disabilities. Many chargepoints, or their surrounding environment, often have features which make them inaccessible to drivers with disabilities, such as:

- chargepoints placed on kerbs, with nearby obstructions, or closely spaced together, presenting difficulties for wheelchair users;
- the weight of the chargepoint cable and the force required to attach the connector to the vehicle being too great for some users; and
- chargepoint features and/or instructions placed too high or too low.

16 Numbers are indicative to aid comparison, and vary based on underlying assumptions. Our calculations assume a battery capacity of 60kWh and typical charging behaviour of charging from 10% to 80% of battery capacity.

3.11 In 2022, DfT co-sponsored, with the charity Motability Foundation, the production of minimum standard requirements for the accessibility of public chargepoints.[17] These cover:

- the physical aspects of the environment surrounding fixed chargepoints (such as kerb height, ground type) and the placing of chargepoints;
- factors to be taken account in the design and specification of accessible chargepoints and their immediate surrounding areas (such as the height of chargepoint components, bollard spacing, screen tilt and, colours used); and
- information (physical and digital), signals and indicators provided.

3.12 Industry and local authorities have reported that further clarity is needed on what constitutes compliance with this standard. For this reason, DfT has not made the standard mandatory for public chargepoints, although it encourages its use. DfT does not collect any data on the accessibility of public chargepoints, so does not know how many currently meet the standard.

3.13 At the end of 2023, DfT established a technical working group, which includes the Motability Foundation and the British Standards Institute, to review issues with the implementation of the accessibility standard. This includes progress made by the sector in installing chargepoints that meet the standard, as well as how accessibility features could be reported through open data requirements. The work of the group will inform a review that is expected to conclude in early 2025, which will advise on what further steps are required, such as potential updates to the standard. It can be difficult to adapt existing chargepoints to comply with the accessibility standard. Should these issues remain unresolved for the continued growth of chargepoints installations in coming years, large portions of the future network could be inaccessible to drivers with disabilities.

17 British Standards Institute, Electric Vehicles Accessible Charging Specification – PAS 1899, 2022.

Appendix One

Our audit approach

Our scope

1 The Department for Transport (DfT) leads on the strategy to reduce carbon emissions from cars. The Office for Zero Emission Vehicles (OZEV) is a team working across government to support the transition to zero-emission vehicles. OZEV ultimately reports to the Secretary of State for Transport.

2 This report examines whether DfT is achieving value for money in the rollout of electric vehicle infrastructure. It covers:

- whether DfT is on track to meet its ambitions for 2030 and the commitments in its strategy;
- whether DfT has set up to deliver its key interventions to support local charging and rapid charging on the strategic road network, and has effectively tackled barriers to installing more chargepoints; and
- whether DfT has intervened effectively to improve customer experience of charging infrastructure.

3 We previously reported on the government's efforts to support the rollout of infrastructure in *Reducing carbon emissions from cars* in 2021. That report also examined DfT's broader efforts to encourage the uptake of electric vehicles, such as subsidy grants for drivers to purchase electric vehicles, which we do not examine in this report.

Our evidence base

4 We reached our independent conclusions on whether DfT is ensuring value for money in the rollout of electric vehicle infrastructure following our analysis of evidence collected primarily between June and October 2024.

Interviews

5 We conducted 25 interviews to assess DfT's delivery of its key interventions; its approach to tackling the barriers to installing more chargepoints; and how it is seeking to improving customer experience of charging infrastructure.

6 Twelve of these interviews were with DfT on key topic areas. We interviewed senior officials and specific team leads on relevant topics. Interview topics included the overall policy approach to increasing the number public and private chargepoints; charging infrastructure on the strategic road network; local charging; the consumer experience of public charging, including the accessibility of chargepoints; chargepoint data and demand modelling; market monitoring; and regulatory oversight.

7 We conducted six interviews with other government departments or public sector bodies to understand their involvement in the delivery of charging infrastructure. We interviewed officials from other relevant parts of government including:

- the Competition and Markets Authority;
- National Highways;
- the LEVI Support Body, comprising Cenex, Energy Saving Trust and PA Consulting;
- Ofgem;
- the Office for Product Safety and Standards; and
- the Department for Energy Security & Net Zero.

8 We also conducted seven interviews with other expert stakeholders who were selected to participate because of their relevance to the audit.

- The Association of Directors for Environment, Economy, Planning and Transport.
- Charge UK.
- The Disabled Persons Transport Advisory Committee.
- The Energy Networks Association.
- The Local Government Association.
- Motability Foundation.
- The Association for Renewable Energy and Clean Technology (REA).

9 Our fieldwork interviews were held virtually over Microsoft Teams.

Document review

10 We reviewed over 200 DfT documents related to the programme. This included reviewing:

- minutes and papers for the various governance forums associated with overseeing and managing the UK electric vehicle infrastructure strategy and its associated programmes; such as those relating to its Zero Emission Vehicle Oversight Group, the Local Electric Vehicle Infrastructure (LEVI) programme, and the Project Rapid decision board;
- planning and strategy documents such as the business cases for the LEVI fund and the rapid charging fund, and third party consultations;
- programme reviews by the Government Internal Audit Agency and the Infrastructure and Projects Authority;
- reports from wider stakeholders such as The Association for Renewable Energy and Clean Technology, the Local Government Association, and Ofgem;
- DfT analysis of total spend on each of the programmes, distribution of chargepoints across the UK, forecasts of chargepoint numbers, chargepoint reliability data; and
- DfT's *Taking charge: the electric vehicle infrastructure strategy* policy paper.

11 We also reviewed past National Audit Officce reports where we have reported on DfT's initiatives to support electric vehicle infrastructure.

Data analysis

12 We undertook analysis of a range of publicly available data as well as data provided by DfT, including data on:

- budgets, allocations and expenditure, and performance information relating to the commitments set out in the DfT's strategy, and its associated programmes;
- scenario modelling carried out by DfT to forecast public chargepoint demand up to 2030;
- the geographic distribution of existing public chargepoints, provided to DfT by Zapmap, available at: www.zap-map.com. Zapmap report they have coverage of over 95% of the network, meaning total numbers may be higher. Chargepoint numbers refer to public, open access charging devices that are usable without a need for a specific make of vehicle. Devices may offer one or multiple connecting socket;

- numbers of rapid and ultra-rapid chargepoints at motorway service areas. These are reported by survey from owners to the Department for Transport. These numbers may use different technical definitions of what counts as a charging device and so may not be directly comparable to other chargepoint numbers used in this report;
- the current power capacity available at motorway service areas against the projected demand to at least 2035;
    - Future charging demand at motorway services areas is uncertain and could be subject to change as the market matures and more data becomes available. Current capacity at some motorway service areas was determined using proxy data and is also likely to change as more data becomes available. As such, the comparisons we report should be treated as indicative.
- the sections of A-roads on the strategic road network where a vehicle with 10% remaining battery capacity could not reach six rapid and/or ultra-rapid chargepoints;
    - The analysis draws on chargepoint location data from Zapmap and a DfT routing algorithm that calculates the driving distance between points on the road and charging devices. This analysis includes closed access chargepoints which may need a specific type of vehicle to use.
- the reliability of chargepoints, provided by Zapmap;
    - Data presented on reliability of public charging devices, was collected by Zapmap, reflecting statuses reported by around 70% of the UK's chargepoint network. It does not reflect the reliability of chargepoints as calculated under the Public Charge Point Regulations 2023. For example, these regulations provide exemptions for specific events such as planned routine maintenance.
- the average cost of charging using home chargepoints compared with public chargepoint of differing speeds. We drew on market data on the cost of charging published by road user groups and Ofgem.
    - Our calculations assume a battery capacity of 60kWh and typical charging behaviour of charging from 10% to 80% of battery capacity. No adjustment has been made for charging efficiency losses.

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