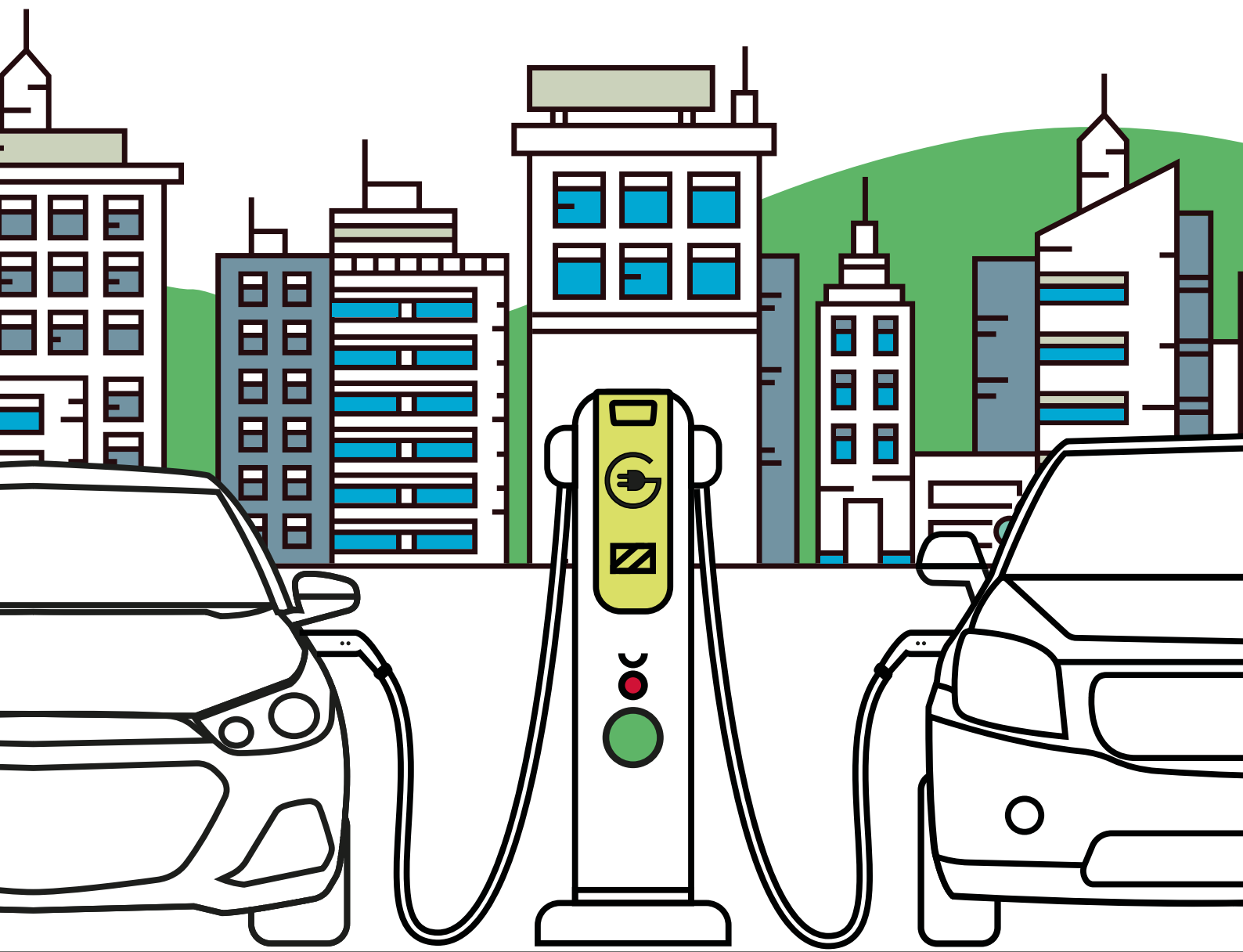


**Minimising the costs of street works  
and grid connections for electric  
vehicle charging infrastructure**

A report by the Energy Saving Trust  
August 2019



This guide is part of a series for local authorities on delivering an electric vehicle charging infrastructure network.

### Abstract

When delivering charging infrastructure, street works and grid connections are important to consider early in the project in order to minimise costs and delays.

### This guide covers:

- the roles of local authorities in relation to street works
- approaches to minimise the cost of street works
- considerations to reduce the impact of electricity grid connection issues.

### Acknowledgments

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### About the Energy Saving Trust

The Energy Saving Trust is the UK's leading impartial organisation helping people save energy, reduce carbon emissions and use water more sustainably. We do this by directly supporting consumers to take action, helping local authorities and communities to save energy, using our expert insight and knowledge, providing quality assurance for goods and services and by working in collaboration with national and international governments and organisations.

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# 1. Introduction

When delivering charging infrastructure, it is important to actively consider street works and grid connections early in the project. Installing and connecting chargepoints can be expensive and the cost depends on the type of equipment, locations selected and the local energy supply.

Local authorities also have statutory duties to control and coordinate street works to minimise disruption.

## 2. The roles of local authorities in relation to street works

Street works are carried out by statutory undertakers, such as utility companies, in order to place, maintain, adjust or renew apparatus in the street, including chargepoints<sup>1</sup>. Where a local authority is the highways authority, they are responsible for timing, directing and coordinating street works (see New Roads and Street Works Act 1991)<sup>2</sup>.

There have been several calls for local authorities and stakeholders to reflect on the experience of delivering superfast broadband and the roll-out of permit schemes. For example, it is recommended that local authorities encourage collaboration between parties and improve consistency in decision-making processes between authorities<sup>3</sup>. The EV-equivalent of the Government's Barrier Busting Taskforce and toolkit outlining good practice for telecoms infrastructure deployment may be beneficial<sup>4</sup>.

Where a local authority is leading the installation of public charging infrastructure, a local authority team is also likely to be responsible for selecting locations and ensuring an accurate procurement tender is released. Some will also 'project manage' in-house and therefore need to coordinate between the supplier, installer, Distribution Network Operator (DNO), street works contractors and others. Delays and additional costs for street works are often frustrating for local authorities but also negatively impact chargepoint suppliers and contractors financially, especially smaller enterprises.

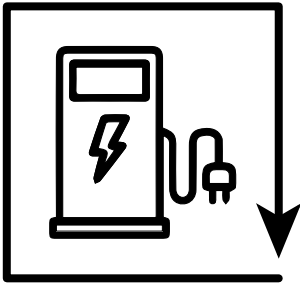
1 Note: road works are works carried out to repair or improve the highway including footways, pavements and street lighting. See <https://www.gov.uk/government/collections/street-works>

2 New Roads and Street Works Act 1991 Code of Practice [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/43578/street-works-code-of-practice.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/43578/street-works-code-of-practice.pdf)

3 For example: <http://streetworks.org.uk/ready-ev-revolution/>

4 Broadband Stakeholder Group, 2018. <http://www.broadbanduk.org/2018/08/03/government-publishes-a-toolkit-to-support-street-works/>

# 3. Approaches to minimise the cost of street works



There are various approaches that local authorities, or any private-sector delivery partner or contractor, can take to minimise chargepoint installation costs and reduce delays and disruption to traffic. Different approaches will be applicable depending on the scale of the project. Arranging the street works and connection costs for a few slow chargepoints in a car park will be less resource-intensive and cheaper than a city centre hub of rapid chargepoints.

## 3.1 Minimise distances between chargepoints and the electricity supply

One straightforward way to reduce the costs of chargepoint installation, possibly by several thousands of pounds, is to minimise the distance between the chargepoint and electricity supply cable. This reduces the trenching involved for cabling to chargepoint columns (free-standing units) and the trunking length for wall-mounted units. Wherever possible, avoid crossing roads with cabling.<sup>5</sup>

Suppliers will require approximate distances from the proposed chargepoint location to the connection point in order to provide a cost estimate. To find the connection point, you may need information from the DNO (i.e. energy grid maps) or if that is unavailable, look for feeder pillars at the proposed locations. See the UK EVSE procurement guide<sup>6</sup> for more assistance, including details on how to complete a site survey.

When trying to minimise the distances, it is likely that a sensible compromise will be needed. Firstly, pedestrian accessibility remains crucial. Secondly, placing chargepoints in the corner of a car park or at the end of a parking row reduces visibility and greatly restricts the number of vehicles that can access at chargepoint at once or in sequence, reducing revenue. See the Energy Saving Trust (EST) guide on Positioning chargepoints and adapting parking policies for electric vehicles for more information on these considerations.

## 3.2 Consider different chargepoint technologies

The costs and time taken to schedule and complete street works can be a factor when deciding what type of charging infrastructure is required. In contrast to free-standing or column chargepoint, lamp column chargepoints and wall-mounted units with a pavement cable channel both require minimal street work and may suit some on-street situations (see the case study on Oxford in the EST guide Positioning chargepoints and adapting parking policies for electric vehicles.)

## 3.3 Consider wayleave agreements

When situating chargepoints, local authorities may want to avoid routing cables across private land, either to connect the chargepoints to the electricity grid or as part of a grid upgrade.

Where cables need to be laid across private land, a wayleave agreement may be needed. Bear in mind that resolving the issue may take several months depending on the complexity of the agreement and the landowner's cooperation.

In cases where an agreement for a wayleave agreement cannot be reached between the installer of electricity equipment and landowner, the Electricity Act 1989 provides the installer with statutory powers if no alternative solution, such as changing the cable route, can be found. A statutory application can be lodged to the Secretary of State for Business, Energy and Industrial Strategy to award the installer a necessary wayleave if they can demonstrate why it is necessary and expedient for the line to be installed. The landowner is able to show how the granting of a wayleave will impact on their use and enjoyment of the land.

<sup>5</sup> UK EVSE, 2015, Making the right connections, p16 <http://ukevse.org.uk/resources/procurement-guidance/>

<sup>6</sup> UK EVSE, 2015, Making the right connections, p15 <http://ukevse.org.uk/resources/procurement-guidance/>

### 3.4 Integrate street works for chargepoints with other projects

Local authorities responsible for highway maintenance will have a schedule for road surface renewals. When considering locations for chargepoints, it is worth consulting the highways or street works team at an early stage to see if works can be coordinated with other works that are already planned. Equally, some roads that have been recently resurfaced may be considered 'closed' to further works for a time period.

If there are any plans for street re-designs or upgrades, ducting for chargepoint cables could be installed in preparation, even if it is felt that chargepoints are not needed immediately. Known as 'passive provision', this will save money later on and preserve the life of the road.

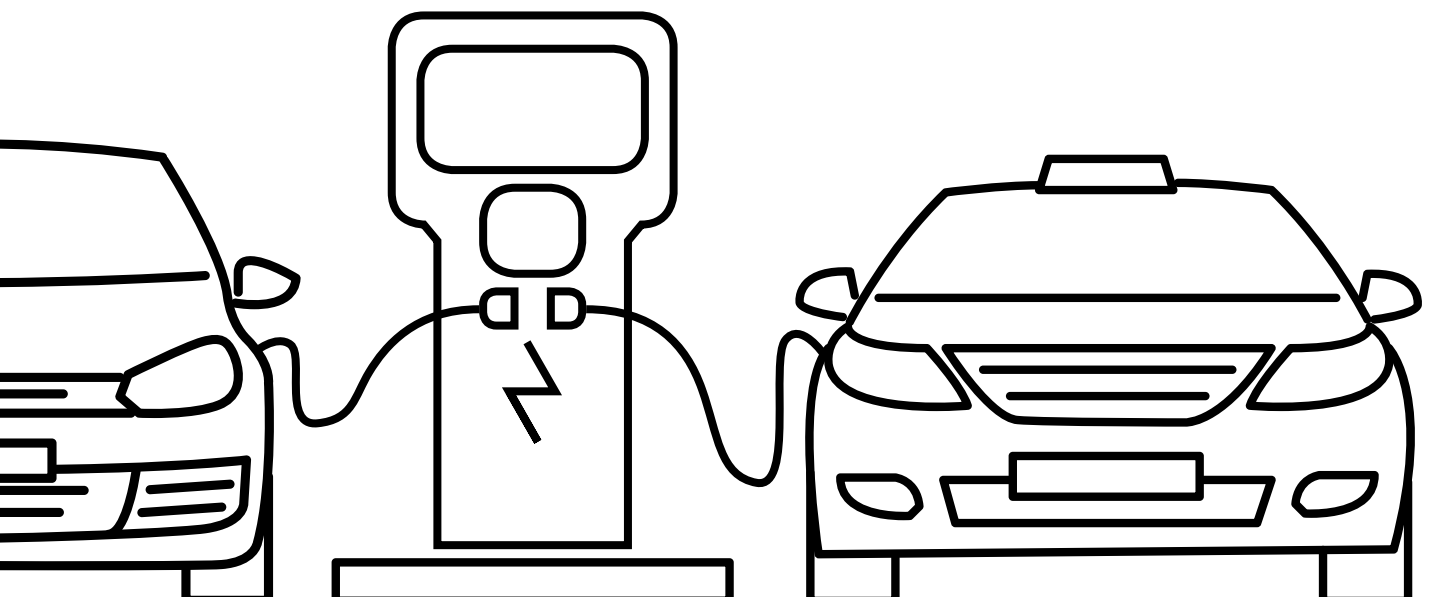
7 HM Government, 2018, Future of lane rental schemes for roadworks <https://www.gov.uk/government/consultations/future-of-lane-rental-schemes-for-roadworks>

8 Street Works UK, 2018, Are we ready for the EV revolution? <http://streetworks.org.uk/ready-ev-revolution/>

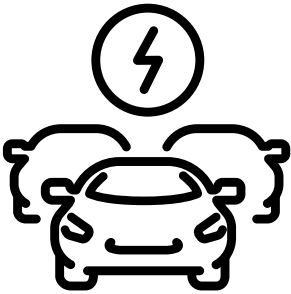
### 3.5 Lane rental schemes

Following successful trials and a consultation, the Department for Transport announced plans to allow the roll-out of lane rental schemes by local authorities, subject to various conditions. Lane rental schemes aim to reduce the impact of street works on the busiest roads at peak times by introducing financial incentives<sup>7</sup>. Utility companies can be charged up to £2,500 a day.

At present, local authorities only have to consider nationally important infrastructure projects, such as HS2. The trade body, Streetworks UK, suggests that a similar exemption could be made for chargepoints<sup>8</sup>.



# 4. Considerations to reduce the impact of electricity grid connection issues



Domestic chargepoints are normally straightforward to connect to the home's energy supply but connecting multiple or higher power chargepoints to an energy supply in car parks and on-street can be slow, difficult and expensive. This means that grid connection issues are best considered in the early stages of the project – ideally before tendering for suppliers – so plans can be adapted or negotiated.

## 4.1 Engage early with the local distribution network operators (DNO) & revise locations

Electricity distribution network operators (DNOs) must help customers connect to their network in a timely and efficient manner and are regulated by Ofgem. Some of the connection and upgrade costs must be paid for by the connecting customer. However OLEV grant funding (i.e. the On-street Residential Chargepoint Scheme) for chargepoints can assist.

In some locations, there may be insufficient supply capacity for the introduction of chargepoints therefore an upgrade or new energy supply connection will be required. The more chargepoints and the higher the power demand, the more likely it is that an upgrade will be required and the more

expensive it will be. Where major difficulties are presented, seek out alternative locations if possible before any tender exercise is undertaken.

The first step is for a local authority (or a contractor/supplier on their behalf) to contact the relevant DNO to check supply capacity and discuss chargepoint requirements, costs and timescales. There are variations between DNOs but for example, SSE indicate that a connection application for one to three fast chargepoints, or one rapid chargepoint, might take 4 to 8 weeks and cost £1,250 to £2,400. Connecting more than three fast chargepoints or up to three rapid chargepoints may take 8 to 16 weeks and cost £4,000 to £75,000. More than three rapid chargepoints will take at least 3 months and cost over £60,000<sup>9</sup>.

To check a location's supply capacity, you may need to pay a fee. As a minimum, the DNO will require the number of chargepoints, proposed locations and type of charging infrastructure (required capacity in current and kVA). The UK EVSE guide<sup>10</sup> offers some estimates on energy supply requirements. Engaging early with the DNO is recommended as the process can be slow. The outcome of this assessment with the DNO should allow a refined list of feasible locations for chargepoints to be produced, ahead of tendering.

<sup>9</sup> Scottish Southern Energy Networks, accessed 2019, EV Connections <https://www.ssen.co.uk/Connections/EVconnections/> (See 'Further resources' for links to guidance produced by other DNOs)

<sup>10</sup> UK EVSE, 2015, Making the right connections, p17 <http://ukevse.org.uk/resources/procurement-guidance/>

## 4.2 Think about how grid connection issues could impact procurement

Some chargepoint operators have expressed concerns to the Energy Saving Trust about how site surveys and grid assessments are being integrated into tenders by local authorities. Operators felt that some local authorities were being unreasonable by asking chargepoint operators to undertake detailed site surveys and DNO engagement for a long list of chargepoints before the award of contracts, at no cost to the authority.

Similarly, problems arise when local authorities decide on a shortlist of locations without considering any grid constraints. The operators suggested that where local authorities take these approaches, they risk dissuading reputable suppliers to submit bids, the delivery of lower-quality site surveys and underestimated project cost. This can result in delays and the risk of major issues later in the project.

To make the procurement process work for both parties, chargepoint operators suggested that local authorities retain some flexibility in their location choices and expect that the final list of locations will be agreed collaboratively after the award of contract.

DNOs face restrictions on whether they can 'invest ahead of need' in anticipation of further grid demand at location. As investment costs are recovered from the bills of current customers and those requesting new connections, (Connection offer expenses regulations, 2018), the DNO must demonstrate to Ofgem that the benefits to customers outweigh the investment cost<sup>11</sup>.

## 4.3 Reconsider different types of charging infrastructure

At the beginning of the project, think carefully about what type of chargepoints are needed where and re-evaluate the plans as more information about the grid capacity becomes available. Higher power chargepoints may seem better but are more expensive and unlikely to be needed in areas where vehicles are going to be parked and plugged-in for several hours or overnight, such as residential streets or park and ride sites.

## 4.4 Anticipate coordinate works between contractors – and expect delays

When reflecting on their experiences on installing chargepoints, some local authority representatives interviewed by the Energy Saving Trust reflected that they had to invest significant time to build a good relationship with their DNO counterparts. They also felt that some chargepoints operators seemed inexperienced in project management, especially where they were relatively new or small outfits handling the on-street or larger-scale projects typically undertaken by local authorities, compared to chargepoints for workplaces or businesses.

In light of this, especially where new connections are required, a local authority should be aware that an individual officer is likely to need to oversee the process and coordinate between contractors in order for installation to proceed smoothly. For example, feeder pillars are not installed by DNOs but must be installed by electrical contractor before the DNO can make the connection.

Opinions are divided on whether the responsibility to engage with DNO and coordinate street works should be included as an additional service or requirement in contracts for suppliers, or should remain with the local authority. See the EVSE guide for more information on project management and responsibilities when installing chargepoints<sup>12</sup>.

In addition, note that as well as several months for a DNO connection, street works can also take up to 6 weeks to approve in some local authorities due to high workloads.

<sup>11</sup> More information about the investment options open to DNOs can be found at <https://www.ofgem.gov.uk/ofgem-publications/87259/guideelectricitydistributionconnectionsolicy.pdf>

<sup>12</sup> UK EVSE, 2015, Making the right connections, p28 <http://ukevse.org.uk/resources/procurement-guidance/>



## 5. Further resources

For an overview of the National Grid's approach to electric vehicles, see <https://www.nationalgrid.com/group/cleaner-transport>

The following DNOs provide information on connecting chargepoints to the grid:

- **Midlands, South West of England and South Wales: Western Power Distribution** <https://www.westernpower.co.uk/connections-landing/connections-useful-information/connections-for-electric-vehicle-charge-points-or-heat-pumps>
- **London and South East, UK Power Networks** <https://www.ukpowernetworks.co.uk/electricity/electric-vehicle-charging-point>
- **South Scotland and North Wales, Scottish Power Energy Networks** [https://www.spenergynetworks.co.uk/pages/electric\\_vehicles.aspx](https://www.spenergynetworks.co.uk/pages/electric_vehicles.aspx)
- **Central-Southern England and North Scotland, Scottish South Energy Networks** <https://www.ssen.co.uk/Connections/EVconnections/>

For information on the process followed by all DNOs concerning charging infrastructure, see the Energy Networks Association: <http://www.energynetworks.org/electricity/futures/electric-vehicles-and-heat-pumps.html>

The UK EVSE guide, Making the right connections, contains detailed and practical information on grid connections for charging infrastructure. See <http://ukevse.org.uk/resources/procurement-guidance/>

## 6. Support from the Energy Saving Trust for local authorities

Through our Local Government Support Programme, Energy Saving Trust provides tailored support to help local authorities improve local air quality and reduce CO2 emissions through sustainable transport initiatives. We offer impartial advice on chargepoint procurement, planning policies, and more. For example, we can facilitate a team workshop or impartially review your draft charging infrastructure plans.

Local authorities based in Scotland can seek support through Switched On Towns and Cities.

EST also manages the On-Street Residential Chargepoint Fund and the eCargo Bike Grant Fund, on behalf of the Office for Low Emission Vehicles and Department for Transport.

We're here to help people across the UK save energy and reduce fuel bills. It's a big task that we won't solve alone. But by working with partners who share our goals, we believe we can make a real difference.

Underpinned by our independent status and impartial perspective, we offer a depth of energy expertise, but we're not content to stand still. Our goal is to find new and better ways to drive change and reduce UK energy consumption.

**[energysavingtrust.org.uk](https://energysavingtrust.org.uk)**

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