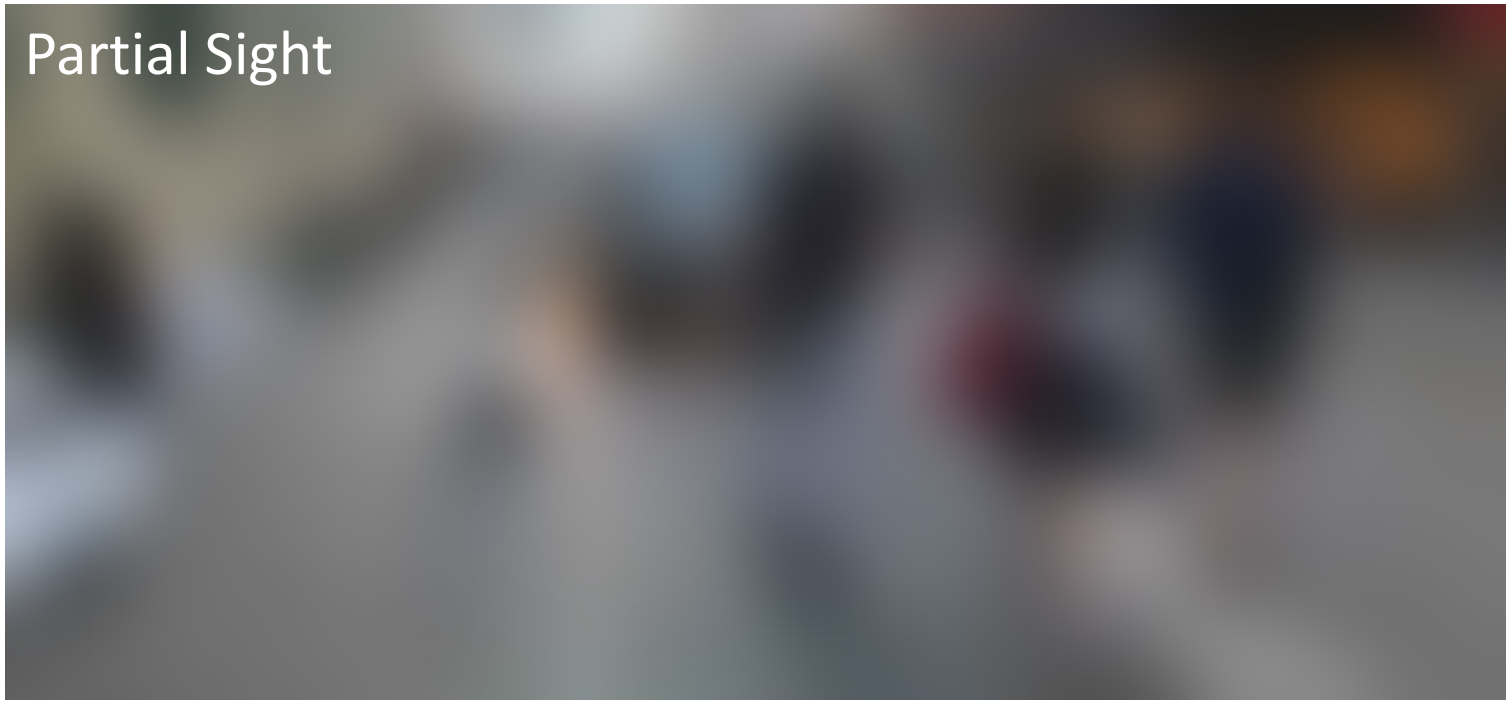
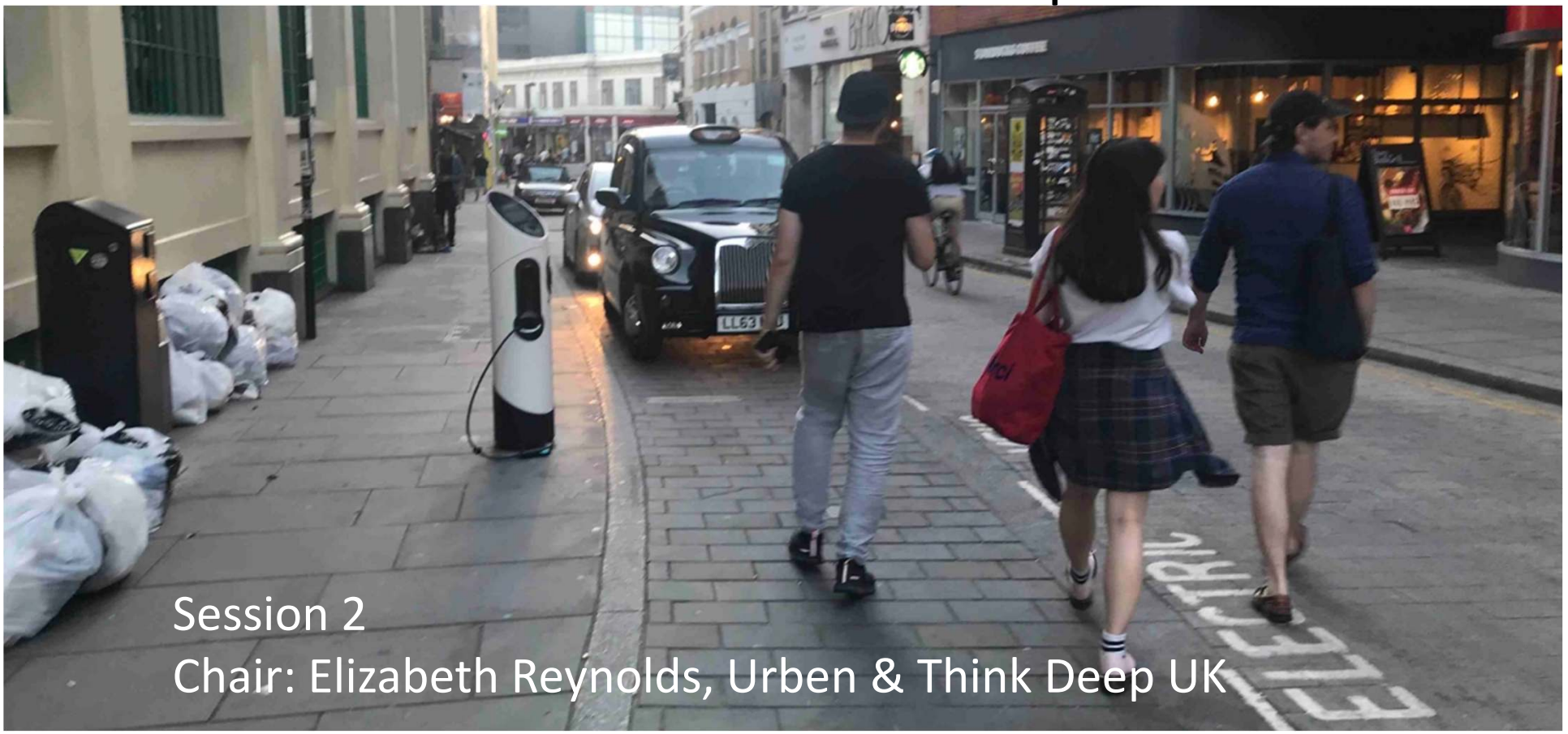

Full-Sight


Partial Sight

Electric Vehicles : Infrastructure and Impact

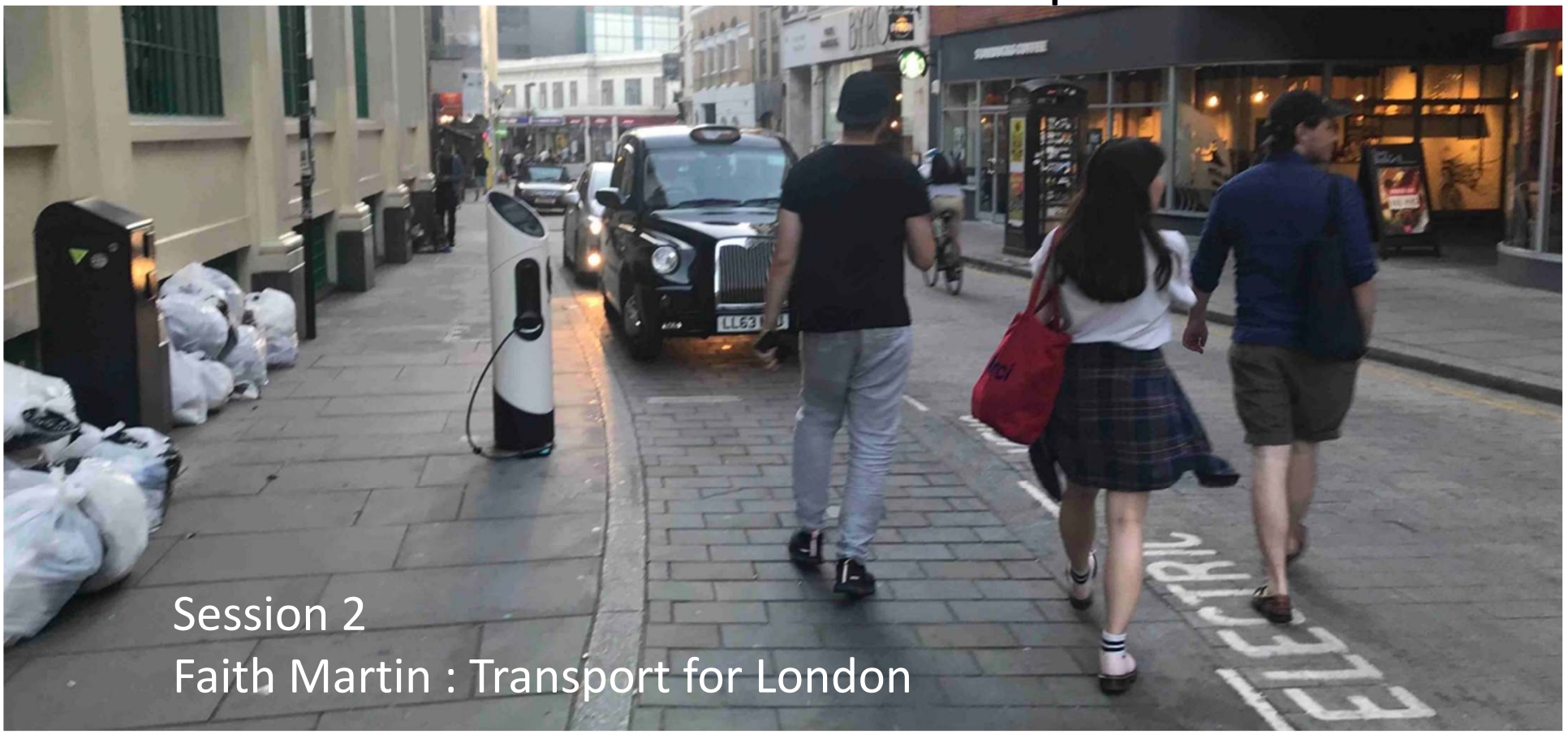
#EVimpact



London Living Streets Urban Design Group

Electric Vehicles : Infrastructure and Impact

#EVimpact



London Living Streets Urban Design Group

11 OCTOBER 2018

Designing healthy streets: EV charge points

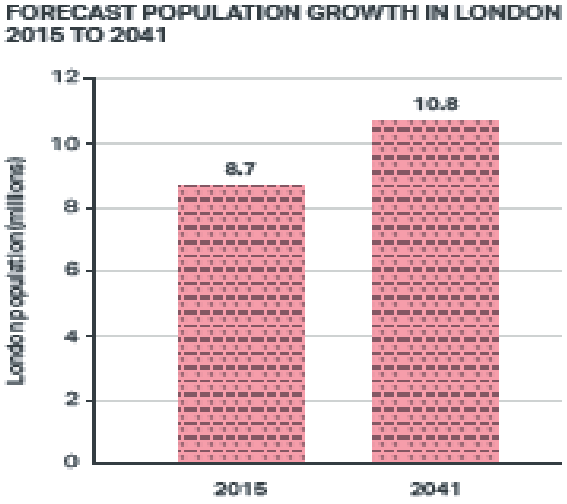
Faith Martin – TfL

Principal technical specialist for pedestrian accessibility

EVERY JOURNEY MATTERS

Mayor's Transport Strategy – Challenges

- London's population predicted to grow to 10.8m by 2041
- Physical inactivity crisis
- London's streets are more for cars not people
- Space constrained in London will not cope with future growth
- Car spaces are inefficient in relation to the numbers of people they often move around
- Motorised traffic is responsible for the main air pollutants



There is now a greater need to design London's streets as places for pedestrians

London's Environment Strategy – Mayoral aims

A zero carbon city by 2050 with targets including:

- Zero emission zones from 2020
- Zero emission capable GLA support fleets by 2025
- Zero emission capable taxi / private hire fleets by 2033
- Zero emission bus fleet by 2037

Installing Electric Vehicle charge points is challenging:

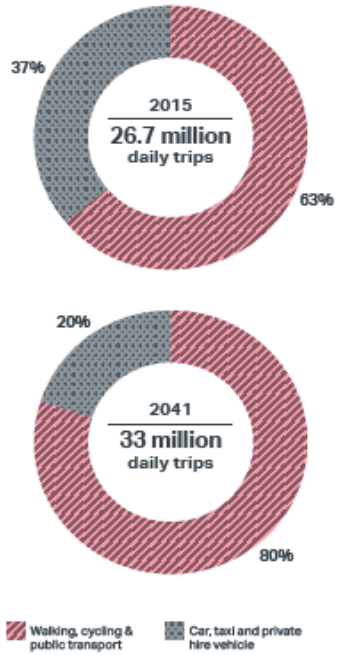
- **Around 2/3 of households have no off-street parking –** affects utilisation assumptions & type of infrastructure needed
- **London's roads differ in priorities & planning** – TfL / Highways England / 33 local authorities
- **Land is valuable and in high demand –** leads to competing demand for sites, especially where most needed

TfL is working towards a healthier environment and transport system for London

TfL's vision for London

- Increase walking, cycling and the use of public transport to 80% of daily trips – sustainable forms of travel
- Reduce road danger
- Improve air quality and reduce London's contribution to climate change
- Reconnect communities
- Revitalise local high streets to support economic growth
- Create streets that are people friendly, enjoyable to use for travel and spend time in

Policy 1
The Mayor, through TfL and the boroughs, and working with stakeholders, will reduce Londoners' dependency on cars in favour of active, efficient and sustainable modes of travel, with the central aim for 80 per cent of all trips in London to be made on foot, by cycle or using public transport by 2041.



'The central aim is for 80 per cent of all trips in London to be made on foot, by cycle or using public transport by 2041.'

We need to have the same vision and design streets for people together

Healthy streets: 10 indicators

Streets that are safe and inclusive for pedestrians work well for everyone

Achieving the best pedestrian outcomes

Principle	Indicator
Safety	Walking environments should be safe to use and feel safe to spend time in
Comfort	Walking environments should allow unhindered movement for all pedestrians and meet demand
Inclusivity	Walking environments should support all types of pedestrians to improve accessibility by creating inclusive streets and places
Directness	Walking environments should not be obstructive, allowing easy and convenient routes to create permeable and connected places for all pedestrians
Legibility	Walking environments should be legible for all pedestrians to know intuitively what places are for and who has priority at any given time.
Attractiveness	Walking environments should be inviting for pedestrians to go through or spend time in.
Connectivity	Walking environments should support key walking routes to meet pedestrian desire lines. Street quality should be consistent to ensure attractiveness is not in isolated areas to support the permeability of places.

Everyone is a pedestrian – walking is the glue that binds all travel

Managing space

- Comfort
- Street furniture
- Crossings
- Cycling facilities
- Bus stops
- Parking – taxis, blue badge holders
- Freight loading bays
- Designing to reduce traffic collisions
- Designing out crime
- Designing for accessibility

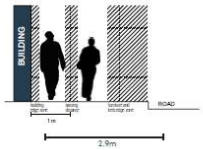
We are creating streets for all types of pedestrians and with other road users

TfL's Pedestrian Comfort Guidance

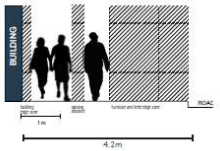
TfLs requirement

9-11 people per minute per metre (B+) – no more than a 31% restricted movement

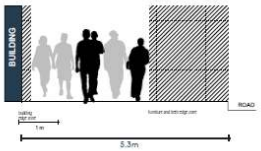
Low Flow
< 600 pph



Active Flow
600 to 1,200 pph



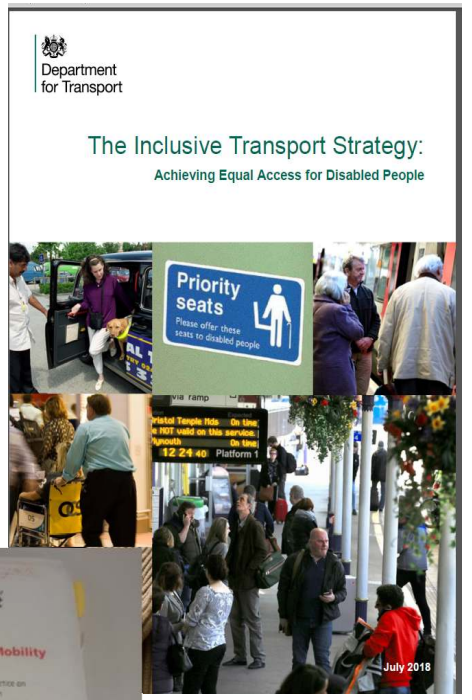
High Flow
> 1,200 pph



Sufficient space will be crucial to ensure EV charging placements are successful

Policy context

- Equality Act 2010 (provision 20) refers to providing transport system that does not disadvantage particular groups of people
- DfT's Inclusive Strategy (July 2018) is to ensure inclusive design - streets to work for everyone
- DfT's Inclusive Mobility recommends preferred minimum 2m width footway to allow two wheelchair users to pass each other
- TfL's Vision Zero Action Plan takes MTS forward for safe streets
- Healthy streets vision means ensuring footways are comfortable and pedestrians do not divert into the carriageway



Streets need to be inclusive to work for everyone, especially disabled pedestrians

TfL's Streetscape Guidance (2015)

Electric vehicle charging points:

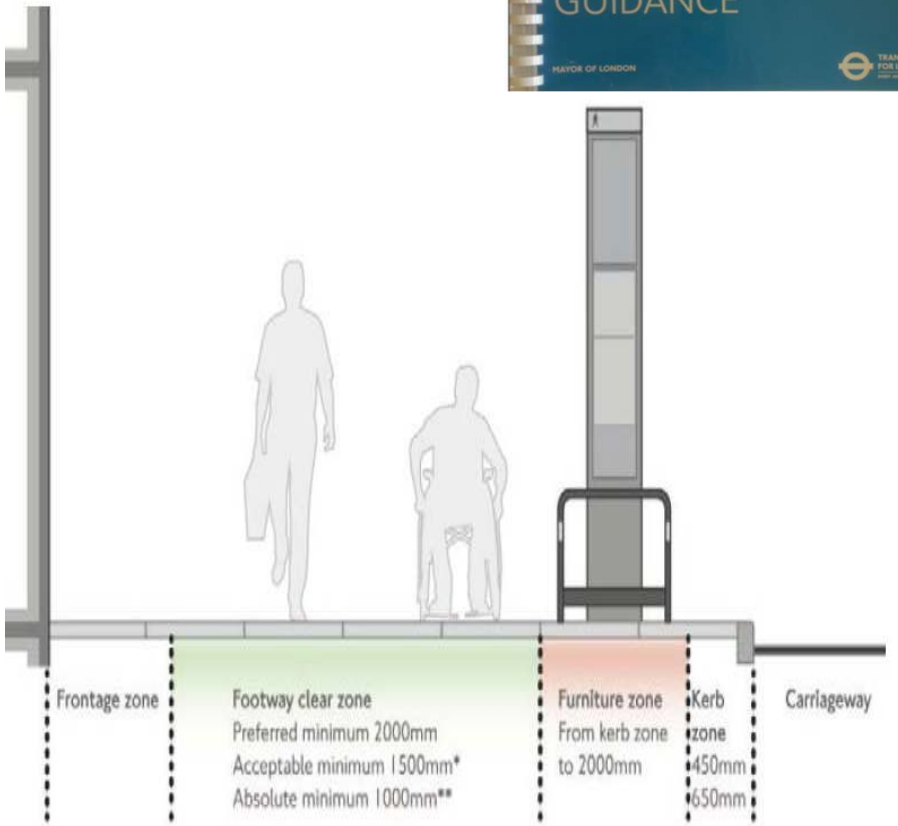
1. Vision and purpose
2. TLRN

Building line to kerb edge

- Can be divided into four zones
- Each zone serves a distinct function within the streetscape

Furniture zone

- Ensures the footway is kept clear for pedestrian access



EV charging placements need to work with the design of the street and should not be obstacles for disabled people, especially visually impaired pedestrians

Badly planned placements – an inefficient use of resource time

Highly charged: complaints as electric car points block city pavements

In the rush to accommodate increasing numbers of electric cars, some cities are letting bulky charging stations take space from pedestrians

▲ An electric car charging point blocks a pavement in London. Photograph: Laura Laker

"Reducing access on our already crowded pavements doesn't help more people to make every day journeys by foot

EVs should benefit the environment - Placements should not cause a dis-benefit.

TfL's will update its Streetscape Guidance – Rapid Charge Points

To avoid:

- reducing footway to <2m or create pinch point(s) - refer to TfL's Pedestrian Comfort Guidance;
- near other street infrastructure;
- near high numbers of utilities;
- within 2m of powered street furniture (lamp columns, existing electrical supply);
- obstructing building frontages;
- within tree root protection zones.

To ensure:

Bollards at RCPs – polymer for electrical safety;

Charge points without plastic insulation – not within 2m of their feeder pillar;

All equipment - 450mm from carriageway or cycle route

Road markings (still to be confirmed with DfT)

TfL's further work to update its Streetscape Guidance

We will aim to:

- Undertake a literary review –
  to study international examples of EVCP placements;
- Research – best practice case studies;
- Hold an EVCP placement workshop 16th October 2018 –
  discussion will include placements on build outs / footway / in carriageway and distances of bollards ;
- Update our Streetscape Guidance - based on gathered information to ensure there is planned success;
- Encourage boroughs
  to include TfL's Streetscape principles into their Streetscape guidance;
- Inform at UDL sessions – on TfL's Streetscape Guidance.

TfL's aim is to promote a code of good practice principles

TfL Surface Transport

City Planning – Delivery Planning
Air Quality, Environment & Active Travel

faithmartin@tfl.gov.uk

Palestra – 4th floor
197 Blackfriars Road
Southwark
London SE1 8NJ

We have a common goal to improve the well being of all Londoners and retain the City's status as the world's lead capital

EVERY JOURNEY MATTERS

Electric Vehicles : Infrastructure and Impact

#EVimpact

London Living Streets Urban Design Group

LONDON LIVING STREETS

Electric Vehicles — Infrastructure and Impact

How Kensington & Chelsea has approached residential EV charging

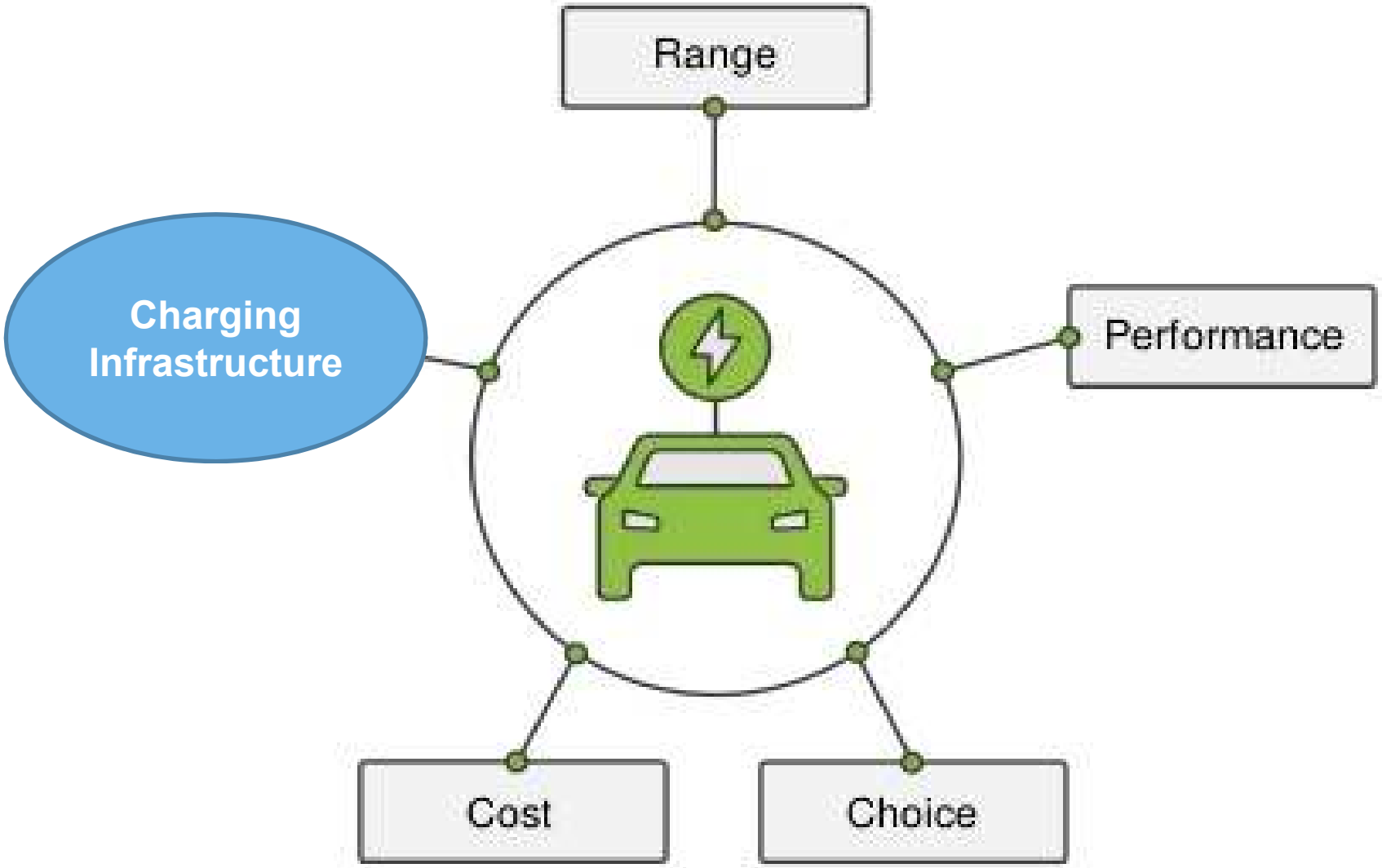
THE ROYAL BOROUGH OF
KENSINGTON
AND CHELSEA

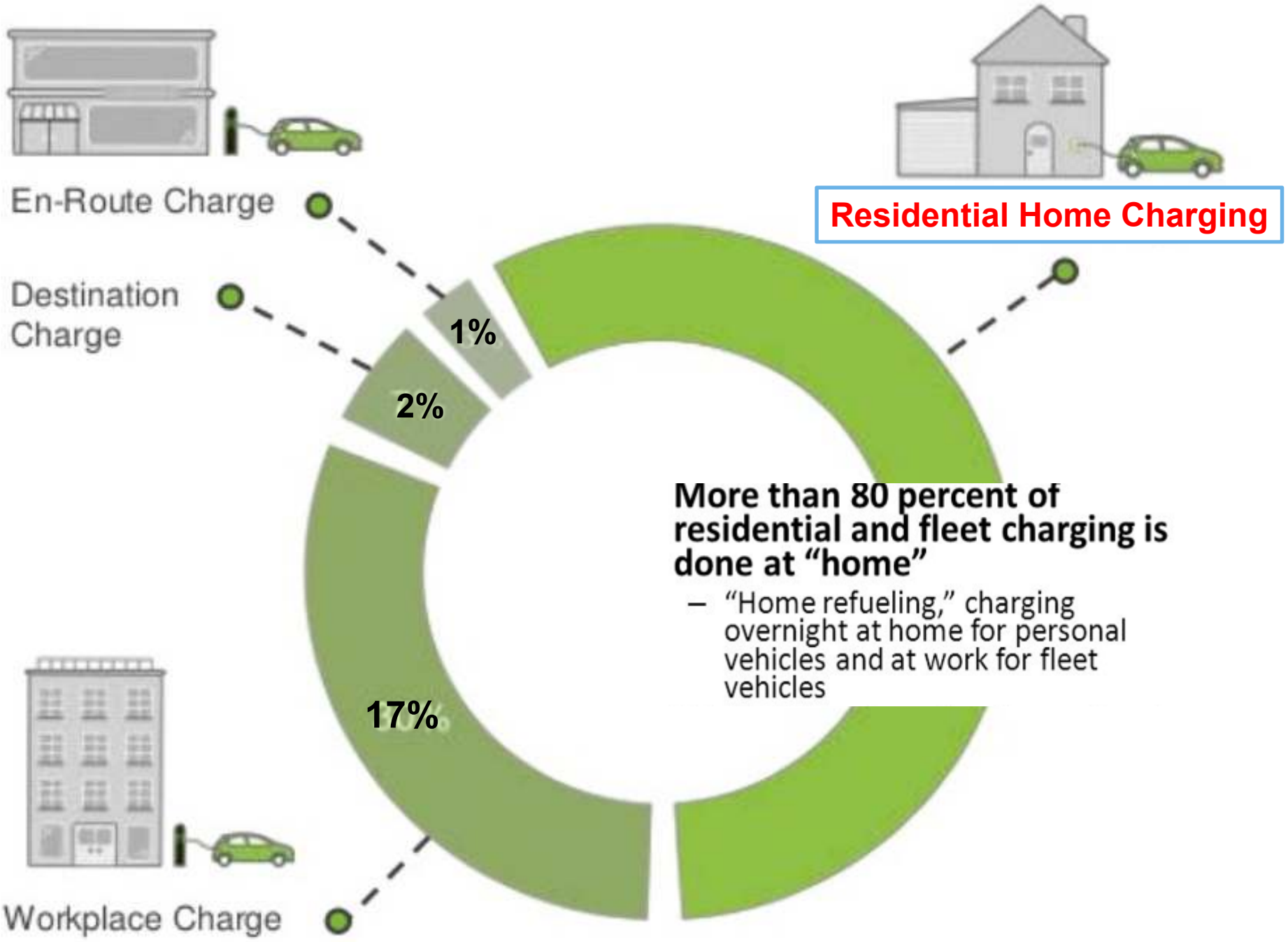
GARY NOBLE

Gary.noble@rbkc.gov.uk
Chief Engineer Royal Borough of Kensington & Chelsea

THE ROYAL BOROUGH OF
KENSINGTON
AND CHELSEA

Barriers to EV




En-Route Charge
Destination Charge
Workplace Charge
Residential Home Charging
1%
2%
17%
More than 80 percent of residential and fleet charging is done at "home"
– "Home refueling," charging overnight at home for personal vehicles and at work for fleet vehicles


13A 230V-240V~
25M CABLE
30/07/2018 09:23


30/07/2018 09:23


30/07/2018 09:23


E
3228 HYP
Autoberón
i3

Opportunities for the borough

The RBKC has:

- Approximately 280 electric vehicle owners with residents permits (and rising)
- Resident on street parking spaces approx. 29,000 but there are 36,000 parking permits
- Very high proportion of on street parking
- Only one resident parking zone – allows residents to park anywhere in the borough
- Conclusion
  - There was a need to develop a new approach to EVCP without designating bays

- Streetscape
  - Street clutter
- Loss of parking
  - Residential or P&D for dedicated EV bay
- Installation costs
- Local disruption during installation
- Traffic Orders required


ubitricity


#ELECTRIC

Successful trial with EVCP on lamp posts

- RBKC Strategy
  - Installation where possible in P&D or single yellow line
    - Advantage - Locations available free outside controlled times, limit possible ‘hogging’ of resident bays
  - Install in groups of three along a road, as no designated bays
  - The Council remains in control of our street lighting assets
  - The cable and contract for the supply and charging will be between the resident and provider
  - The Council will require a charge to cover future maintenance and replacements costs
    - Plug-in charge and usage charge to deter ‘hogging’ the EVCP


The Royal Borough of Kensington and Chelsea
Electric Vehicles Map
Source London charging point
Lamp Column charging point
Off-Street charging point
EV requests
Potential Lamp column charging points
P&D bay
P&D bay and Single yellow line
Electric Vehicles in the borough
Tesla
Other Make
Grid_800m_18pt6degrees
N
THE ROYAL BOROUGH OF KENSINGTON AND CHELSEA
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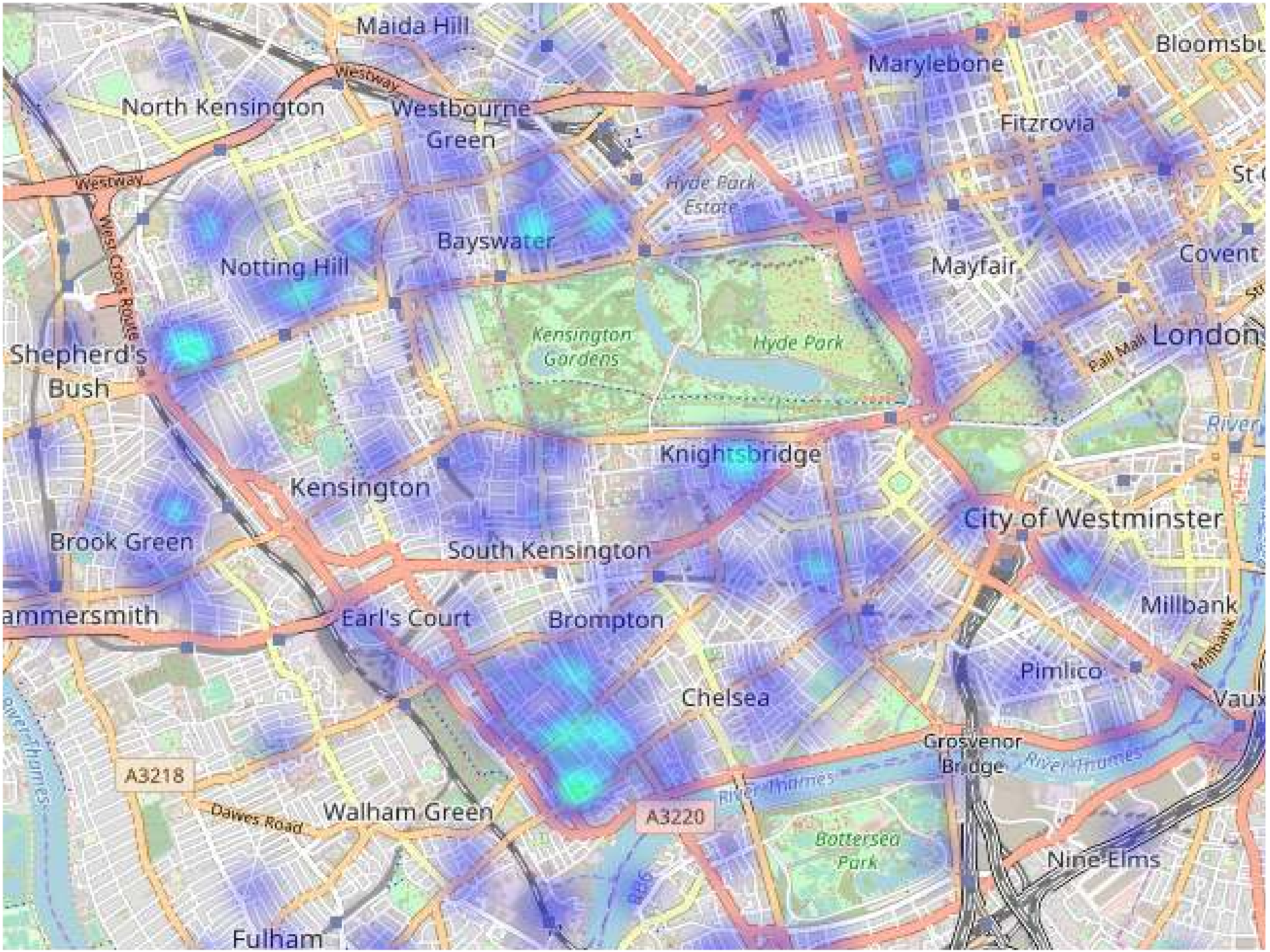
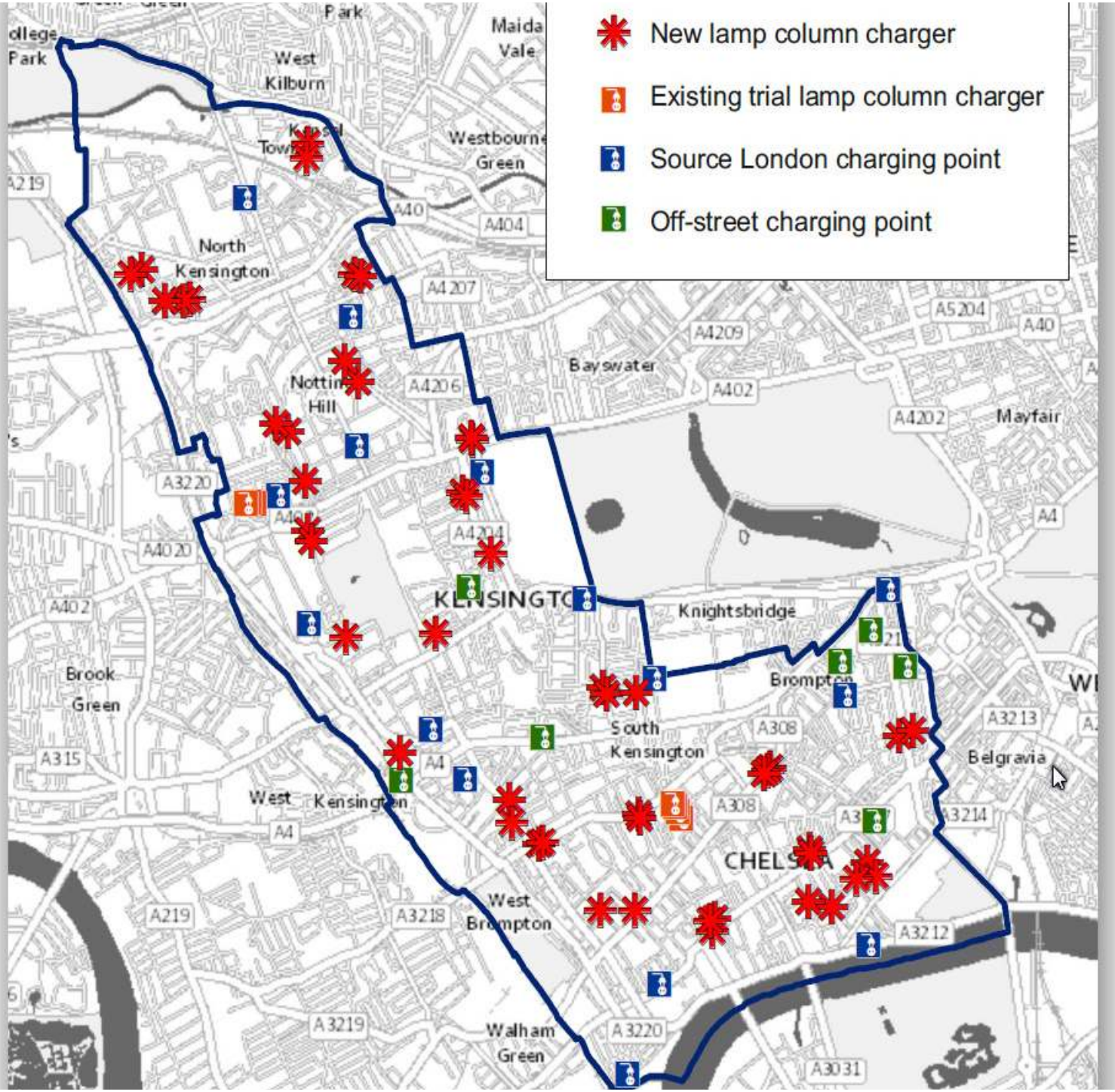

Maida Hill
Westway
North Kensington
Westbourne Green
Marylebone
Fitzrovia
Bloomsbu
Hyde Park Estate
Westway
West Cross Route
Bayswater
Notting Hill
Mayfair
Covent
Kensington Gardens
Hyde Park
Pall Mall
London
Shepherd's Bush
River
Knightsbridge
Kensington
City of Westminster
Brook Green
South Kensington
Millbank
ammersmith
Earl's Court
Brompton
Pimlico
Millbank
Chelsea
Vaux
Grosvenor Bridge
River Thames
A3218
Dawes Road
Walham Green
A3220
Battersea Park
Nine Elms
Fulham


New lamp column charger
Existing trial lamp column charger
Source London charging point
Off-street charging point
Park
Maida Vale
West Kilburn
Westbourne Green
North Kensington
Notting Hill
Bayswater
Mayfair
Knightsbridge
Brompton
South Kensington
Belgravia
Brook Green
West Kensington
West Brompton
Walham Green
A40
A404
A4207
A4209
A5204
A4206
A402
A4202
A3220
A4020
A4204
A4
A315
A308
A3213
A3214
A219
A3218
A3212
A3219
A3220
A3031

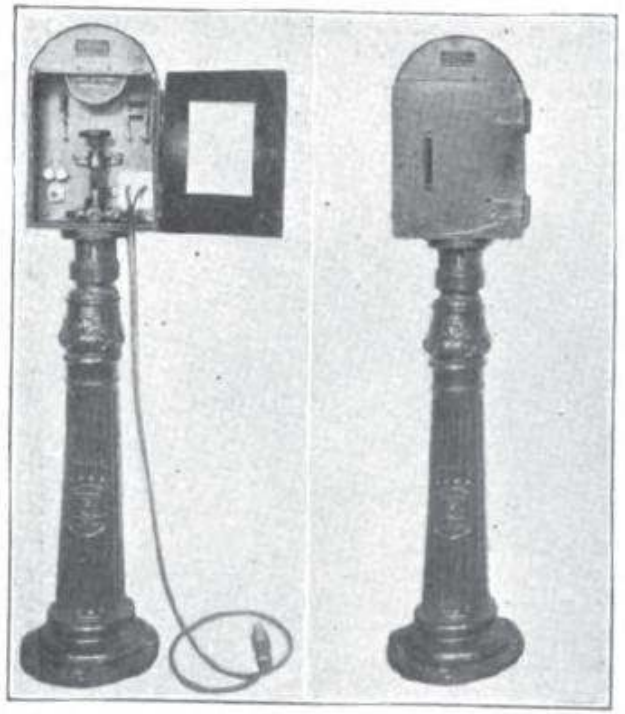

Free
Standing
Solution

Conclusion

- EVCP in lamp columns provides more flexibility
- It has been well received by those using them, ‘good charging experience’
- Easy enough to install and redeploy if required
- Our strategy is:
  - The Council will continue to; manage, maintain its own assets and the equipment including the EVCP within the columns
  - The responsibility for the cable, meter, billing and usage will be the responsibility of the user and provider of the service
- The units installed will:
  - Increase our knowledge of usage
  - Test our strategies
  - Test demand

Public Electric-Vehicle-Charging Station

A compact charging station for electric automobiles, which is inclosed in a weatherproof box and is mounted on a pedestal so that it can be placed near the curb, is shown in the accompanying illustration. A charging cable and plug are provided, and while the battery is being charged the door can be closed and locked. A



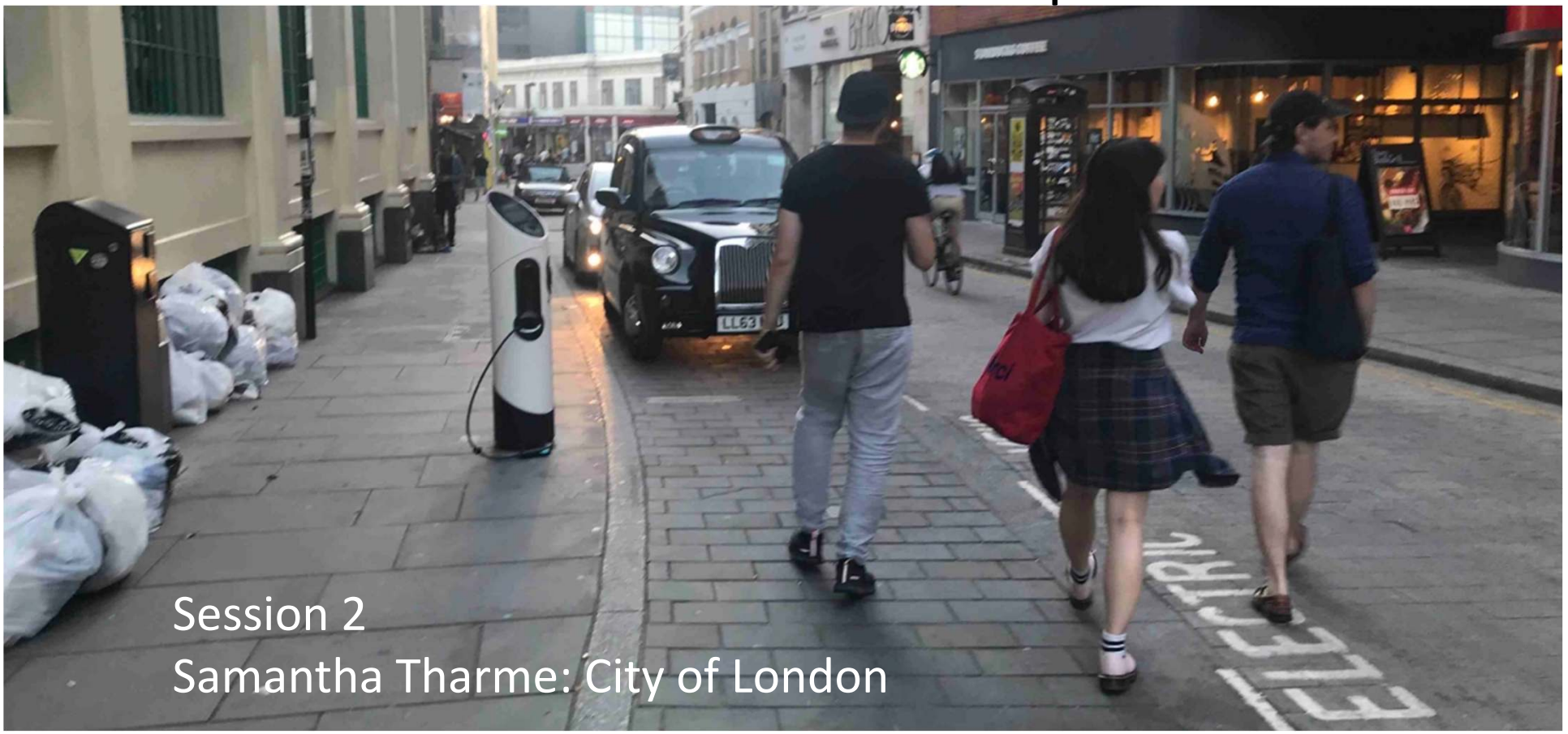
FIGS. 1 AND 2—CURB CHARGING STATION FOR ELECTRIC AUTOMOBILES

regulating rheostat, ammeter, polarity indicator, lamp, switches, etc., are mounted on a slate panel as shown in Fig. 1. The box is of sheet steel and is electrically welded. The pedestal is of cast iron. Connection with the direct-current supply is made through conduit passing underneath the sidewalk. A prepayment meter may be used if desired, but on account of the numerous sizes and kinds of batteries and varying conditions an attendant is usually required.

This device for charging electric cars at the curb is made in two sizes with ratings of 100 amp and 150 amp and is being placed on the market by Clarence E. Ogden, 514 Mercantile Library Building, Cincinnati, Ohio.

Electric Vehicles : Infrastructure and Impact

#EVimpact



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Electric Vehicles : Infrastructure and Impact

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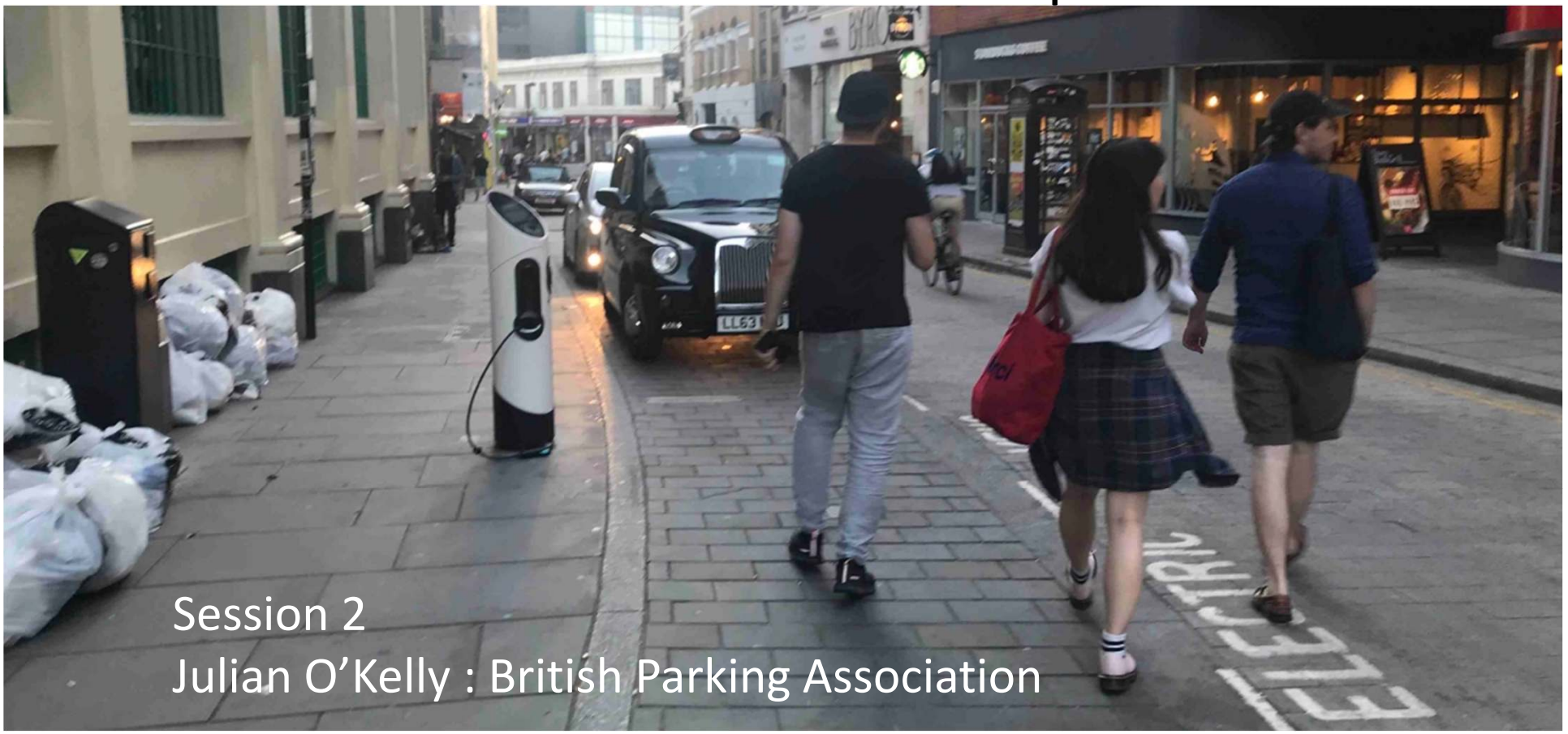


London Living Streets Urban Design Group

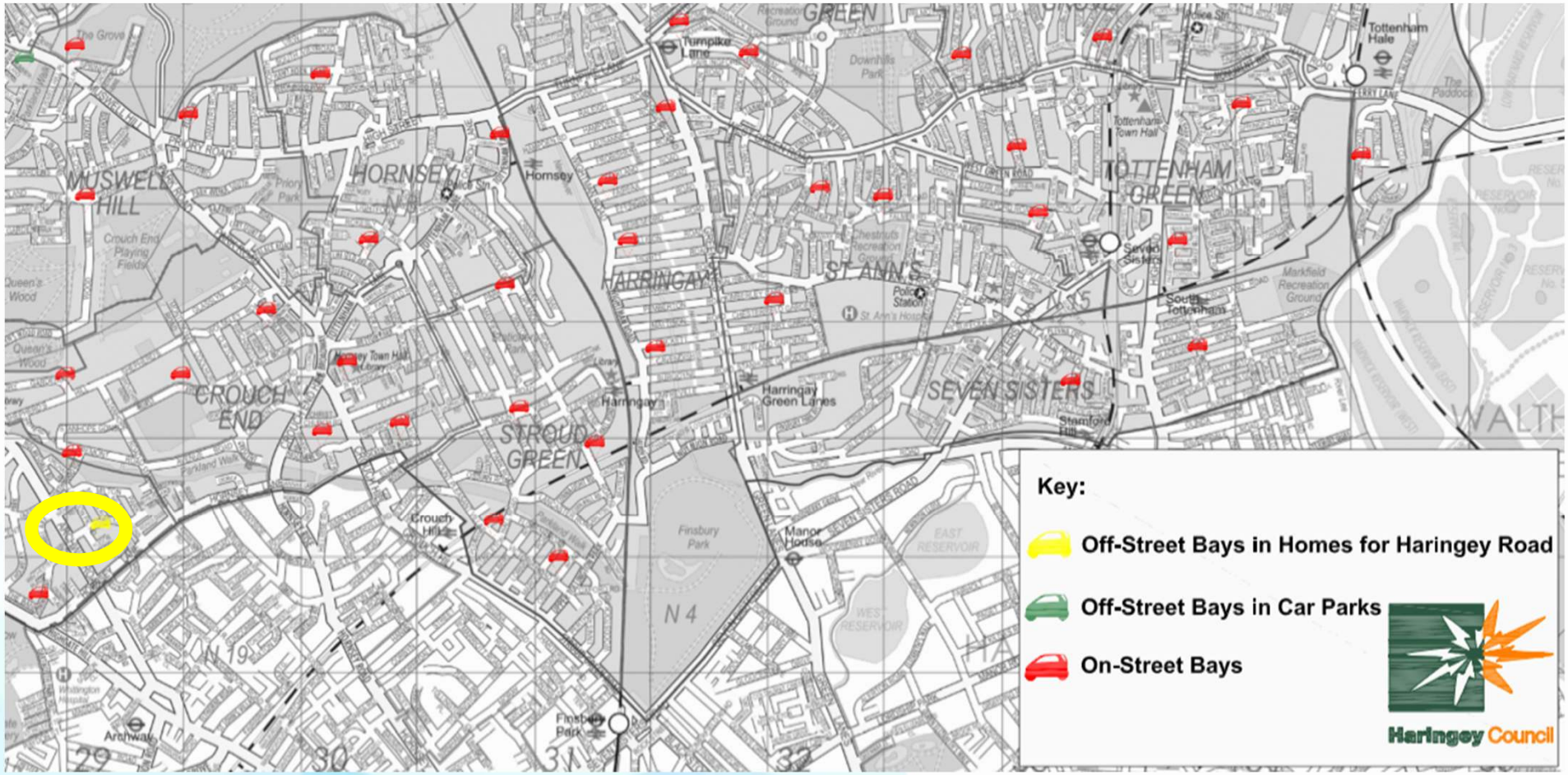
Can we take electric vehicles off streets and into car parks ?

Julian O'Kelly PhD

Head of Technology Innovation and Research

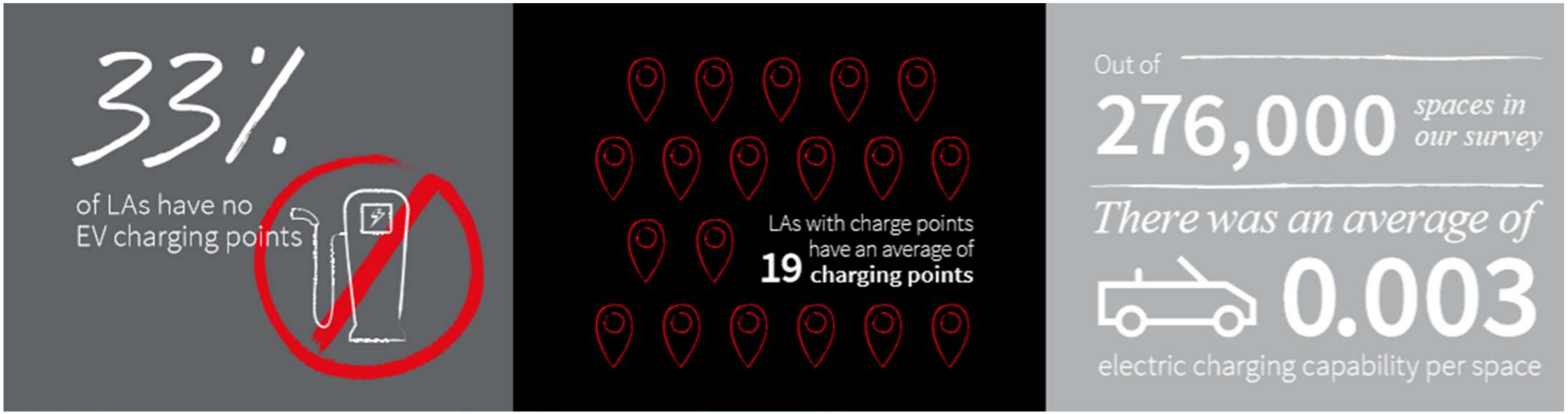
britishparking.co.uk

BPA


Key:
Off-Street Bays in Homes for Haringey Road
Off-Street Bays in Car Parks
On-Street Bays
Haringey Council
MUSWELL HILL
HORNSEY
HARRINGAY
ST ANN'S
TOTTENHAM GREEN
CROUCH END
STROUD GREEN
SEVEN SISTERS
Turnpike Lane
Tottenham Hale
Harringay Green Lanes
Finsbury Park
Manor House
Archway
N4
N19

Local authority electric vehicle

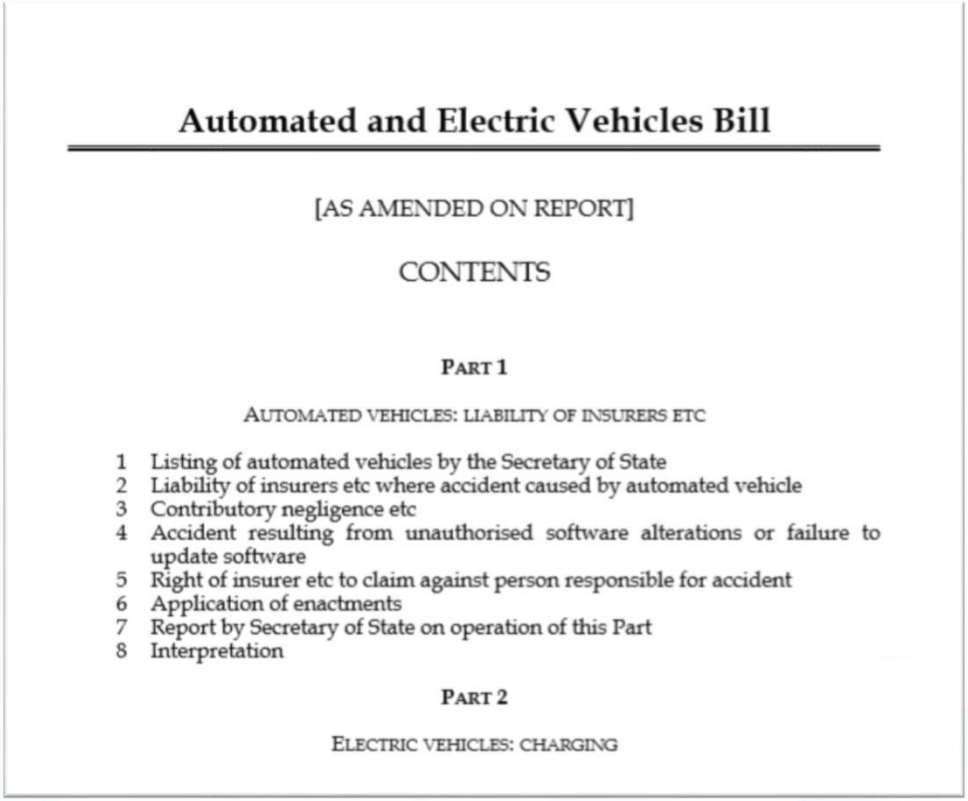
survey results 2017



- 69% Local Authorities don't have a budget to increase or install EV points
- 36% did not know if they were eligible for govt grants

Automated & EV Bill 2018

…we believe the Bill does not go far enough.... Investment in infrastructure must be encouraged, through removal of bureaucratic hurdles and simpler, more consistent grant schemes.



Automated and Electric Vehicles Bill

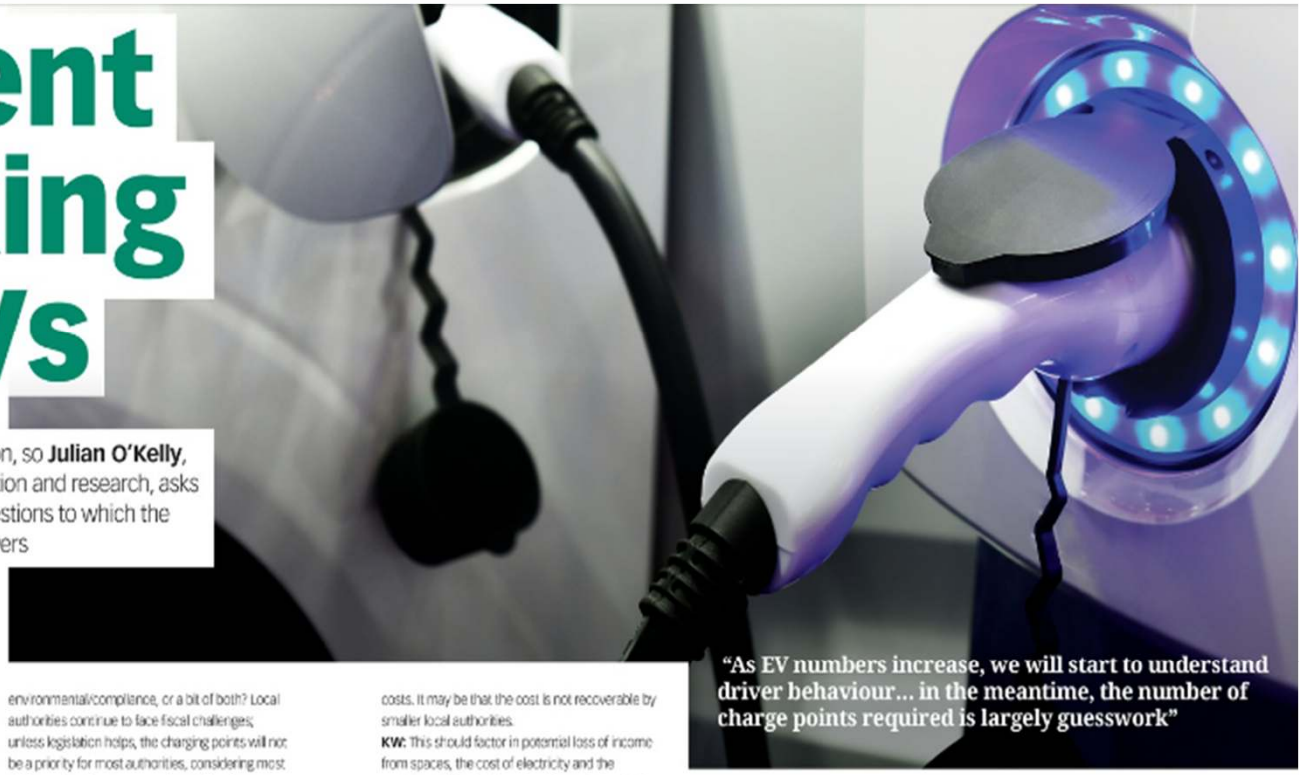
[AS AMENDED ON REPORT]

CONTENTS

'the government promised that they will look into encouraging destination charging outside of the AEV Bill, working with the car parking industry. Government will also work with the Institution of Civil Engineers to ensure that industry guidance for car parks includes provision of charging installation'

EDF ENVIRONMENTAL DEFENSE FUND
Finding the ways that work

Current thinking on EVs



Electric vehicles are on the horizon, so **Julian O'Kelly**, BPA's head of technology, innovation and research, asks members and colleagues the questions to which the whole parking sector wants answers

It's all happening in the electric vehicle (EV) world again. The BPA is being consulted by the government in its call for evidence on the 'Future of Mobility' – from ride services to electric and automatic vehicles – and by those involved in developing sustainable, innovative 'Last Mile' solutions for deliveries.

In the same spirit of discovery, I wanted to gain the perspective of members and colleagues involved with EVs on a daily basis. So I spoke to BPA Council chairs Anjna Patel MBE (AP, Professional Standards) and Manny Rasores (MR, Parking Technologies Group), Keith Williams (KW, BPA Technology, Innovation and Research Board), Louise Clancy (LC, Go Ultra Low City manager, London Councils), Grahame Rose (BPA Board member), and Steve Clark (BPA head of operational services) – and asked them the questions many operators are pondering.

HOW SHOULD OPERATORS DECIDE HOW MANY CHARGE POINTS TO INSTALL?

MR: The most efficient way is to prepare for the expected growth – look at the many projections available for the next five years rather than gradually increase annually. While EV ownership in the UK is around 0.5 per cent now, it could go to 5 per cent soon, and it's different across the country: around 2 per cent in parts of London already.

KW: The key is knowing your customers and what type of (non-residential) charge points are appropriate. These may be slower chargers for long-stay/commuter parking, or faster for short stay, such as retail. However, drivers don't top up their petrol tanks at every forecourt they pass, so why would they use your chargers? As EV numbers increase, we will start to understand driver behaviour and this will enable you to plan. In the meantime, the number of charge points required is largely guesswork.

SHOULD LOCAL AUTHORITIES PROVIDE FREE SPACES TO INCENTIVISE TAKE-UP AND LEAD THE WAY IN REDUCING EMISSIONS?

AP: There is no one fix. In a less thriving setting, free may be desirable, politically. However, many authorities have little knowledge of the capital and revenue costs. There is also the question of whether they are legitimately able to sell electricity.

LC: This is for boroughs to consider; however, this can be seen as wealthy people being able to purchase parking spaces.

MR: Free spaces might be needed initially, but this would need reviewing as demand increases. Also, a solution to non-EVs parking in dedicated spaces is needed, especially in automated barrier car parks with no staff to oversee this.

KW: Should EV users be given free parking? Should they get free electricity? This may depend on customer types. I doubt a motorist's decision to buy an EV would depend on free electricity at a short-term car park, but a commuter may be influenced by access to free parking and/or power. If a commuter uses a charging bay, however, only one EV a day will get the benefit. You need to be very careful that commuter and season-ticket parkers don't use up free charging bays to the detriment of other customers and limit the subsidy to a small number of people.

WHAT PARTNERS SHOULD YOU PICK?

AP: It depends on the strategy – is it fiscal or environmental/compliance, or a bit of both? Local authorities continue to face fiscal challenges; unless legislation helps, the charging points will not be a priority for most authorities, considering most of them either lose money or barely break even.

LC: As well as charge-point suppliers and operators, boroughs work with the local community so charge points are installed in locations that are viable for them.

MR: Look carefully at how they structure charges compared to your anticipated use patterns – for example, pay as you go versus monthly charge, plus a small amount per kW hour. Drivers might end up paying fees comparable to an efficient petrol/diesel vehicle, negating the cost benefit of EVs.

WHAT'S THE REAL UPFRONT COST?

LC: Upfront costs should cover items such as the charge point, site surveys, installation, connection to the electricity network, the traffic management order (in London), and signs and lines. Costs vary – for example, £15k for a freestanding 7kW charge point and its installation. Lighting column charge points are much cheaper, but generally lower power.

AP: Costs vary because each supplier provides bespoke solutions. So it's impossible to benchmark capital costs and compare the ongoing revenue costs. It may be that the cost is not recoverable by smaller local authorities.

KW: This should factor in potential loss of income from spaces, the cost of electricity and the equipment. It is also important to consider what the return on investment will be and whether joining a network that provides charging points for a lower cost (or free) is a better option. We have no way of knowing how fast technology will change, so explore options where providers install for free and then factor the obsolescence risk in relation to operational/maintenance charges. Again, know your customers; you'll get several slow charges for the price of a fast one, which may suit the usage patterns you expect.

WHAT ARE YOUR KEY STEPS IN THE DECISION-MAKING PROCESS FOR A SUCCESSFUL CHARGE-POINT INSTALLATION?

AP: The key considerations are: legislative incentives or penalties related to installation; environmental incentives/penalties; consumer pressures, dependant on the availability of data on EV ownership; and buy-in from all users, providers and facilitators.

LC: If a parking bay is dedicated to EVs only, they will need a traffic management order in London. Planning permission may also be required. P

"As EV numbers increase, we will start to understand driver behaviour... in the meantime, the number of charge points required is largely guesswork"

PRIVATE SECTOR

Some of those issues overlap with the private sector, as **Steve Clark** points out: 'Enforcement is a key issue. How do you balance the need for protected bays against those for disabled and parent/child bays? The cost of installing cabling infrastructure, and safety and security concerns, will add to the inclination to site EV bays near main areas and shopping destinations – but nearness to destination is an equally important issue for the disabled and family parkers. Too much support for EVs in this respect could cause resentment among petrol-vehicle drivers.

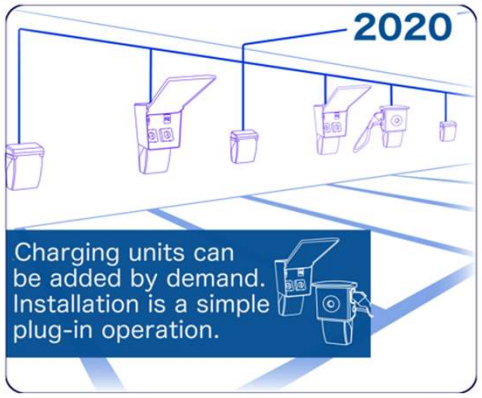
Grahame Rose believes private operators have their own unique set of issues to address, especially around free parking: 'Clearly the customer would prefer EV charging to be free, but this will be unsustainable in the long run. Where a car park charges to park, I suspect the cost will be incorporated in the tariff – but where parking is free, there will be a cost to motorists. I also think large companies, such as supermarkets, may offer free charging if customers shop instore. This would see some sort of validation at the charging point.'

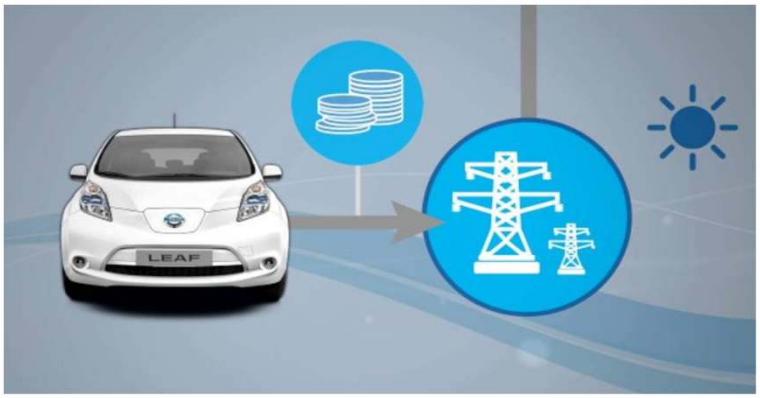
TOMORROW'S WORLD TODAY

The EV market is set to evolve in many ways and, with it, its impact on parking – from the influence of government policies and advances in technology, to changes in the way we want to move and rationalise our journeys, using ride-sharing and mobility as a service options.

The BPA's new Technology, Innovation and Research Board meets for the first time in September and will be watching these developments keenly. I look forward to working with the board to ensure the BPA supports its members in – to quote the theme of our annual conference – preparing for 'Tomorrow's World Today'.


2017
Cabling: Quick Connectors are installed in every parking space.


2020
Charging units can be added by demand. Installation is a simple plug-in operation.


LEAF


VOLKSWAGEN
WOB VB 232


Electric re-charging lane

Can we take electric vehicles off streets and into car parks ?

Julian O'Kelly PhD

Head of Technology Innovation and Research

BPA