The Future of Driving

BY DILLON SMITH & TOM CLOUGHERTY

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Executive summary

Britain is a nation of drivers. Of the 645 billion kilometres travelled in Great Britain in 2021, 88% were via cars, vans or taxis.[1] In polling for this report, 80% of the public reported having access to a car, rising to 87% among rural voters.[2]

But the very fact that so many of us drive cars makes this policy area peculiarly fraught. You have campaigners pointing out the awful impact of air pollution on many people's lives, not least children living near major arterial routes. You have drivers and residents who are intensely frustrated by delays and congestion – which in turn increases air pollution. You have a Treasury which has grown used to treating motorists as a cash cow, extracting far more from them in taxation than is ever ploughed back into the road network – as well as local administrations who have often given the impression that they are using the environment as a pretext to milk drivers further. You have a nationwide shift away from petrol and diesel vehicles towards a zero emissions future which promises to do amazing things for the environment, but awful things to the public finances.

> **'This report seeks to address three of the biggest policy problems associated with driving in the UK: congestion, poor air quality, and taxation'**

This report seeks to address three of the biggest policy problems associated with driving in the UK: **congestion**, **poor air quality**, and **taxation**. Drawing on extensive polling and focus group work, as well as further recent polling by Campaign for Better Transport, it will set out how to move towards a fairer, greener and more popular basis for driving policy and driving taxation, as well as the pitfalls that lie ahead.

It will show that **congestion** is a drag on the economy, a burden on the environment, and a source of serious frustration in many ordinary Britons' lives. Average road speeds have been painfully low for decades and without intervention will only get worse. It will highlight that in many parts of Britain, **air pollution** is above safe levels and regularly rises above statutory limits – and that road transport is a major source of the particulate matter and nitrogen dioxide emissions that weigh heavily on too many Britons' respiratory and cardiovascular health. And it will set out how to address the **£25bn fiscal black hole** that will be left as receipts from fuel duty dwindle, which has been described by the Office for Budget Responsibility as 'the largest single long-term fiscal cost of successful decarbonisation'.[3]

1 Department for Transport, '*Transport Statistics Great Britain: 2022 Summary*', December 2022. Link

2 Polling commissioned for this report by BMG Research, surveying c. 2,100 individuals - see here for polling summary, here for detailed polling results and here for focus group summary. Question: *Which of the following vehicles do you have access to either as a driver or a passenger? Please only consider vehicles your household owns or leases and not public transport or ridesharing services.*

3 Office for Budget Responsibility, '*What does faster take-up of electric cars mean for tax receipts?*', March 2022. Link

These are clearly quite distinct policy problems. But they are linked by a common solution – namely, a fundamental shift in the way we pay for road use, away from fuel and vehicle excise duties, and towards a modern 'pay as you drive' system. This should be accompanied, within the big cities, by the use of clean air zones to incentivise those driving the most polluting vehicles to upgrade to cleaner ones – supported, we suggest, by generous scrappage schemes funded by the accompanying revenues.

'As our opinion research confirms, neither of these key reforms will succeed if they are seen as a 'stealth tax' or as a way to force people out of their cars'

As our opinion research confirms, neither of these key reforms will succeed if they are seen as a '**stealth tax'** or as a way to force people out of their cars. Voters are instinctively wary of changes in motoring taxation, particularly after the U-turn on diesel vehicles. This is why communications around reform must be crystal clear about their objectives. For clean air zones, the health benefits of clean air should be front and centre, as well as the fact that charging is a last resort intended to nudge people into upgrading their cars (in a perfect world, no one will pay the charge as everyone will have cleaner vehicles). Yet in some cities motorists have become convinced that policies intended to help clean up the air are in fact simply a ruse to raise revenue, most recently in London with the expansion of the Ultra Low Emission Zone (ULEZ).

Similarly, 'pay as you drive' schemes should initially apply only to **Zero Emissions Vehicles** (ZEVs) which pay nothing for their usage of the road today. As our focus groups confirmed, EV drivers can see the taxman coming for them a mile off and begrudgingly accept that they will eventually have to make a greater fiscal contribution. Yet rather than replicate the current regime, the Government should take the opportunity to build a better and fairer system.

Greater **hypothecation** of revenues is also likely to be a useful tool in building and sustaining support for a new 'pay as you drive' system. Our focus groups confirmed that linking the funds raised to road improvements would increase their support for the system overall.

We also need to minimise the impact of reform on people's lives. While 'pay as you drive' should eventually apply to *all* vehicles and serve as a comprehensive replacement for fuel and vehicle excise duties, an immediate 'big bang' reform is impractical and likely to backfire politically.

Instead, we suggest:

- Bringing in a per mile charging system for electric vehicles, to ensure that they pay their fair share. However, the aim should be that ZEV drivers still pay significantly less than their petrol and diesel counterparts, giving drivers a reason to make their next vehicle purchase a ZEV.

- These changes should be signposted well in advance. Charges for ZEVs should not come in until later this decade so as not to dent take-up (and give time to work out the practicalities).

- Each vehicle would be assigned a per mile rate, based on its weight (to reflect wear on the roads). Charges would be collected monthly by direct debit.

- There are a variety of technological options that could be used to implement such a scheme, ranging from low-tech (submitting your mileage manually) and mid-tech (an on-board device that transmits mileage automatically) to high-tech (GPS tracking). In general, we should be sensitive to privacy concerns, and let people pick the option they are most comfortable with. Since we are not proposing 'smart' charging at a national level, the Government would not need time or location data.

- To reflect the public's concerns about fairness, drivers would receive a 'free mileage allowance' based on their postcode. Drivers in remote areas with limited or non-existent public transport options would receive a higher allowance than big city drivers well-served by trains and buses. Concessions could also be granted based on disability, low income, and so on – though such measures would involve a clear trade-off with economic efficiency.

- Busy urban areas should be supported to introduce their own congestion charging schemes designed to shift journeys away from peak times and towards public transport or active travel. Local and regional governments should also press ahead with clean air zones where they are appropriate and needed to bring NO_2 down to safe levels, while ensuring that public concerns are effectively addressed through better communication, tighter revenue hypothecation, and more generous and flexible scrappage schemes.

- In the long run, the Government may wish to combine clean air, congestion and per mile charges into a single nationwide charging scheme. In the nearer term, however, it is better to treat congestion and air quality as the local issues that they are, while letting national government focus on implementing a simple 'pay as you drive' per mile charging system for ZEVs.

Our research shows that this is a vision for the future of driving that can deliver cleaner air, quicker roads and lower and fairer costs for consumers. But it must be delivered in an open and transparent way – rather than pitting different groups against each other, and local and national governments against the long-suffering motorist.

Chapter 1: Introduction

This report seeks to address three of the main issues that crop up again and again when discussing the future of road transport in the UK. The first is its impact on air quality – an issue of enormous concern to many millions of people, especially in the cities. The second is congestion, which not only exacerbates air quality issues but inflicts huge misery on drivers and commuters on a daily basis. And the third, particularly important from the point of view of the Treasury, is what will replace the £25 billion currently generated by fuel duty as we move towards zero emissions vehicles – in part to address concerns around air quality, in addition to the need to decarbonise the economy.

These are, of course, distinct policy problems. Yet we see an important common thread: namely, that each of these problems is best addressed by changing the way drivers pay for road use in the UK.

> **'The goal is to engineer a shift away from reliance on 20th century excise duties and towards the adoption of a thoroughly 21st century system of road user charging'**

We have therefore set out in this research to devise a coherent and integrated strategy for policy change. The goal is to engineer a shift away from reliance on 20th century excise duties and towards the adoption of a thoroughly 21st century system of *road user charging* – a new approach designed to meet multiple policy objectives in a practical, straightforward and economically efficient way. This is based on an extensive analysis of the existing literature, conversations with numerous organisations and policy experts, as well polling and focus group work carried out by BMG Research for the Centre for Policy Studies (as well as recent polling from Campaign for Better Transport specifically on road pricing as a policy).

Subsequent chapters in this report will develop our ideas in more detail. But we will start with an examination of the status quo for British motoring, and the serious fiscal, environmental and economic challenges that it poses.

The road funding 'black hole'

Let us start with the money. Currently, motorists are taxed principally through two mechanisms – fuel duty and vehicle excise duty (VED). Fuel duty is levied at the pump, included in the price that motorists pay for petrol and diesel, and is currently set at 52.95 pence per litre. While fuel duty has been frozen for the last few years (and cut by 5p by Rishi Sunak as Chancellor), it is still high by European standards and very high by international ones.[4] Once you include VAT at 20% (applied after fuel

4 Tax Foundation, *'Gas Taxes in Europe'*, 9 July 2020. Link
US Department of Energy Alternative Fuels Data Center, *'Fuel Taxes by Country'*, March 2019. Link

duty), taxes make up c. 50% of the price of petrol, and similar for diesel.[5] The overall tax take is thus substantial – the Office for Budget Responsibility (OBR) estimates that in 2022-23, fuel duties will have raised c. £25 billion, equivalent to c. £900 per household or 1% of national income.[6]

Vehicle excise duty, meanwhile, is paid when a car is purchased. For the first year, the tax amount varies according to the CO_2 emissions of the car. Drivers of electric vehicles pay no VED (though they will from 2025), while relatively fuel-efficient new cars see a charge of £10-£30, and more polluting vehicles can pay up to a maximum of £2,605.[7]

From the second year onwards (for cars registered from 2017) the payment is flat at £180 for most petrol and diesel vehicles, and £0 for EVs (until 2025). Luxury vehicles (defined as those with a list price of higher than £40,000) also have to pay a luxury supplement of £390 per year. The OBR estimates that in 2022-23 VED will have raised c. £7 billion, equivalent to c. £260 per household or 0.3% of national income.[8]

> **'The average car driver shoulders a significant burden of unrelated taxation relative to someone who does not own a car'**

Despite being raised via the taxation of motorists, neither fuel duty nor VED are directly hypothecated to funding for roads or transport. In 2015, George Osborne announced that all VED raised in England would go directly to the National Roads Fund to finance local and strategic road upgrades.[9] But this pledge was apparently watered down in 2021.[10] Revenue from fuel duty is not hypothecated in any way, and instead is disbursed across the whole of government to spend on for example the NHS, schools or defence.[11] Indeed, while in 2021-22 fuel duty and VED raised a combined £33bn, the Government spent only £5.4bn on national roads and £6.4bn on local roads in the same period.[12]

In other words, the average car driver shoulders a significant burden of unrelated taxation relative to someone who does not own a car. (In some cases, of course, driving does create negative externalities that an efficient tax system should 'price in'.) That said, because the rate of fuel duty has been frozen since 2011 (before being cut last year), receipts going to the Treasury have fallen as a share of GDP.[13]

5 RAC, '*Petrol and diesel prices in the UK*'. Link

6 The relevant figures for 2023-24 are £24.3 billion raised, equivalent to £867 per household and 0.9% of national income. Office for Budget Responsibility, '*Fuel Duty*', January 2023. Link

7 Money Helper, '*Car tax bands explained*', 2023. Link

8 The relevant figures for 2023-24 are £8.0 billion raised, equivalent to £284 per household and 0.3% of national income. Office for Budget Responsibility, '*Vehicle excise duty*', January 2023. Link

9 House of Lords Library, '*Funding road: coming full circle?*' December 2020. Link

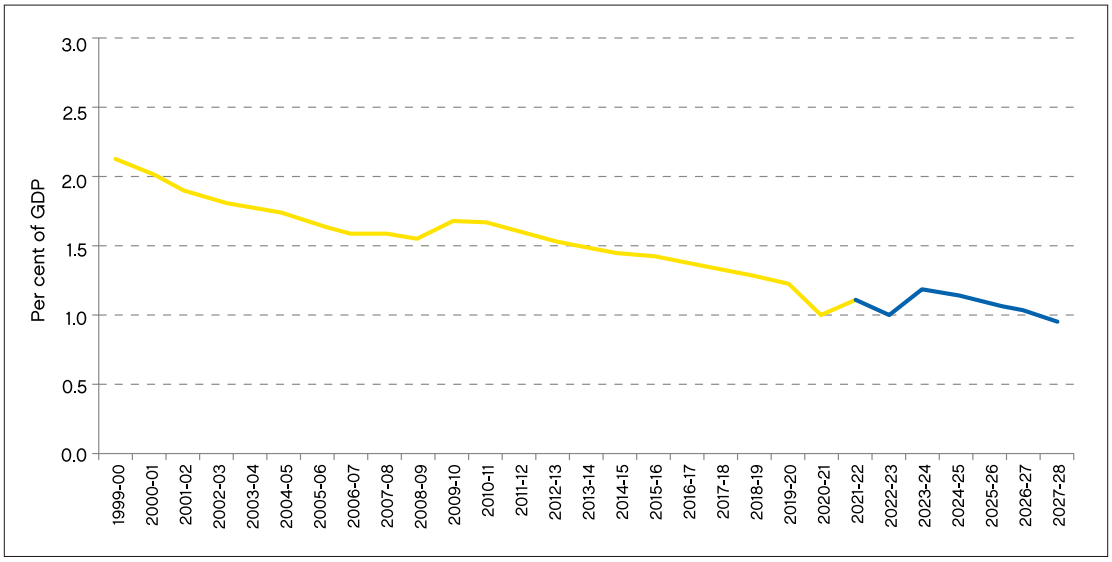
10 Highways Magazine, 'VED hypothecation 'fizzles out' after £2bn Treasury raid', 5 November 2021. Link

11 House of Commons Transport Committee, '*Road pricing: Fourth Report of Session 2021-22*', February 2022. Link

12 Per Department for Transport data on UK Public Expenditure on Transport by Function. Department for Transport, '*Public expenditure on transport by function (Dataset TSGB1303)*', December 2022. Link

13 Office for Budget Responsibility, '*Fuel Duty*', January 2023. Link

Fuel duty as a percentage of GDP



Source: OBR

This hints at the looming issue for both fuel duty and VED. In order to decarbonise the UK's road transport system – an essential precondition for reaching Net Zero – the Government has strived to increase take-up of zero emissions vehicles (ZEVs) through a variety of policy incentives, including direct grants as well as huge investments in charging infrastructure. In 2030, the sale of new petrol and diesel cars will be banned, and from 2035 the ban will be extended to hybrids.

Yet while the increase in EVs is to be celebrated from an environmental perspective, one obvious consequence is that receipts coming into the Treasury from fuel duty will wither away over the coming decades. The Transport Select Committee has referred to this issue as a '£35 billion fiscal black hole' while the OBR has declared it the 'largest single long-term fiscal cost of successful decarbonisation'.[14]

This issue is admittedly limited in scale today, given that the number of battery electric vehicles (BEVs) and hybrids on the roads is still relatively small (c. 660,000 and 445,000 respectively out of 33 million registered cars).[15] But the problem will only continue to grow. Indeed, the Government's own carbon budgets assume that ZEVs will make up 25% of the total car fleet by 2030, and 52% by 2035.[16]

There is also an urgency for the Treasury that the numbers might not suggest – namely, the risk that electric vehicle owners become accustomed to paying no tax, making it ever more politically difficult to change this as times goes on. As Claire Haigh, founder and chief executive officer of Greener Transport Solutions, testified to the Transport Select Committee last year:

14 House of Commons Transport Committee, '*Road pricing: Fourth Report of Session 2021-22*', February 2022. Link
Office for Budget Responsibility, '*What does faster take-up of electric cars mean for tax receipts?*', March 2022. Link

15 Heycar, '*Electric car statistics - data and projections*', January 2023. Link
Nimblefins, *'Number of Cars in the UK 2023'*, December 2022. Link

16 HM Government, '*Carbon Budget Delivery* Plan', March 2023. Link. Appendix C, Table 7 (page 171)

> If we do not move fast, people will just bank the fact that if you buy your electric vehicle you do not have to pay much in running costs. If that becomes part of the psychology of owning an electric vehicle [...] we have no hope of filling that hole and changing how we pay.[17]

Now, there is a case that this is not actually a public policy problem per se. If the Government is unable to claw back as much money from motorists, that should be actively celebrated by those who claim to believe in lower taxes, such as Tory MPs.

'The Government's own carbon budgets assume that ZEVs will make up 25% of the total car fleet by 2030, and 52% by 2035'

However, there are two objections to this view. The first is that driving does produce externalities, whatever the engine type – whether that be air pollution, wear and tear on the roads, or traffic congestion. Indeed, by their nature EVs tend to be significantly heavier than their petrol or diesel counterparts (mostly due to the battery), meaning that they will cause more damage to the roads over time.[18] The second is that it is unlikely that the British state will simply accept the loss of billions in revenue, and cut its cloth accordingly – the Treasury is far more likely to compensate by increasing taxes in some other fashion. So there is a clear need to produce an alternative to the current system – ideally one that is more proportionate and fairer to the motorist.

Air pollution in the UK

Pollution is a blight on our cities and towns. It can have significant effects on citizens' health (especially the elderly), local economies and the liveability of an area. In our polling, 79% of voters said they were concerned about it as an issue, including 83% of Conservative voters in 2019.[19] More than half of the population, 52%, had specific concerns about the quality of the air in their local area (including 48% of Tory voters), and 64% said politicians had done too little to tackle the issue – again including many Tory voters.[20]

While there are a variety of specific air pollutants that affect human health, the two most relevant to road transport are particulate matter (such as $PM_{2.5}$ and PM_{10}) and nitrogen dioxide (NO_2). Both are harmful to the human respiratory and cardiovascular system. Influential modelling by King's College London (KCL) estimated the total mortality burden of long-term exposure to $PM_{2.5}$ for the year 2010 at 3,537 deaths at typical ages, and 5,879 deaths for NO_2.[21]

Road transport was the third largest source of $PM_{2.5}$ and PM_{10} in the UK overall in 2019 (and fourth in 2021). But in larger cities like London, it is the largest individual

17 House of Commons Transport Committee, '*Road pricing: Fourth Report of Session 2021-22*', February 2022. Link

18 Vanarama, '*Are Electric Cars Heavier Than Petrol Ones?*', 2023. Link

19 BMG Research polling for CPS

20 Ibid.

21 King's College London (Walton et. al), '*Understanding the Health Impacts of Air Pollution in London*', July 2015. Link

source, accounting for 30% of local emissions.[22] It is however important to recognise that much $PM_{2.5}$ pollution is not generated locally. Modelling for the Mayor's Office conducted by KCL estimates that nearly half of London's $PM_{2.5}$ pollution is not created in London, coming rather from regional and non-UK sources.[23]

While tailpipe exhausts do emit $PM_{2.5}$, a larger issue is air pollution from non-exhaust sources such as braking and tyre wear – which of course applies to all vehicles, even zero emission ones.[24]

> **'NO_2 is an intensely local issue – road transport is the biggest source in the UK, and the main source of exposure is at the roadside'**

One way to bring local emissions from road transport down is therefore to reduce vehicle usage overall, for example via shifting journeys on to public transport. However, this is not the aim of the current generation of clean air zone policies, which primarily tackle NO_2 rather than $PM_{2.5}$. NO_2 *is* mostly from tailpipe exhausts (caused by the combustion of fossil fuels), particularly from older vehicles which were sold before more stringent standards were introduced.

Unlike $PM_{2.5}$, NO_2 is an intensely local issue – road transport is the biggest source in the UK, and the main source of exposure is at the roadside.[25] Thus according to the UK's Clean Air Strategy (released in 2019), 'our most immediate air quality challenge is to bring roadside concentrations of nitrogen oxides within legal limits in the shortest possible time'.[26]

The UK has put in place statutory air quality standards for each of the relevant particles. For $PM_{2.5}$ the current annual mean concentration limit is 20 μg/m3 (the relevant measure of air pollution), although the Government has announced a target of 10 μg/m3 by 2040.[27] For NO_2 the limit is split between annual and 1-hour averages, of 40 μg/m3 and 200 μg/m3, respectively.[28] These limits follow WHO guidance on safe levels for human habitation.

Unfortunately, however, the UK is failing to meet its statutory limits for NO_2, particularly in its largest cities. The latest data shows that London and Manchester have many individual locations where the NO_2 limits are being breached, making these areas unsafe for residents.[29]

22 Department for Environment, Food & Rural Affairs, *'Tables: Emissions of air pollutants in the UK, 1990 to 2021, by pollutant and by major emissions source'*, February 2023. Link
Mayor of London, '*$PM_{2.5}$ in London: Roadmap to meeting World Health Organization guidelines by 2030'*, October 2019. Link

23 Mayor of London, '*$PM_{2.5}$* in London: Roadmap to meeting World Health Organization guidelines by 2030', October 2019. Link

24 Katsikouli, Panagiota; Ferraro, Pietro; Timoney, David & Shorten, Robert, '*On DICE-free Smart Cities, Particulate Matter, and Feedback-Enabled Access Control*', June 2019. Link

25 Department for Environment, Food & Rural Affairs, '*Clean Air Strategy 2019*', Link

26 Ibid.

27 Department for Environment, Food & Rural Affairs, *'Policy Paper: Air quality strategy: framework for local authority delivery: Annex A: tables of pollutants and limits'*, April 2023. Link

28 Ibid.

29 Department for Environment, Food & Rural Affairs, '*Air Pollution in the UK 2021: Compliance Assessment Summary*', September 2022. Link

Compliance assessment for NO_2 in London[30]

Pollution measure	UK statutory limit value	Average NO_2[12]	Maximum NO_2[13]	Locations >40.4 µg/m³	Locations >36 µg/m³	Compliance assessment
NO_2 annual mean	40 µ g/m³	36 µ g/m³	78 µ g/m³	422	659	Non-compliant
NO_2 1-hour mean	200 µ g/m³	N/A	147 µ g/m³	N/A	N/A	Compliant

Source: CBI Economics

Compliance assessment for NO_2 in Greater Manchester[31]

Pollution measure	UK statutory limit value	Average NO_2[13]	Maximum NO_2[14]	Locations >40.4 µg/m³	Locations >36 µg/m³	Compliance assessment
NO_2 annual mean	40 µ g/m³	31 µ g/m³	59 µ g/m³	9	22	Non-compliant
NO_2 1-hour mean	200 µ g/m³	N/A	130 µ g/m³	N/A	N/A	Compliant

Source: CBI Economics

The health impacts of such high NO_2 levels fall disproportionately on the elderly and those with respiratory conditions such as asthma. Short-term exposure can lead to symptoms such as coughing, wheezing or difficulty breathing, while longer exposures may contribute to higher asthma and other respiratory infection rates.[32] In Greater Manchester, for example, 15% of all deaths and 8% of hospital admissions in 2019 were due to respiratory conditions, with similar numbers for other large cities such as London and Birmingham.[33]

Reducing levels of NO_2 in dense urban cores could therefore have a significant impact on the health of their citizens. According to CBI Economics, reducing NO_2 by 10 µg/m3 could prevent between 286 and 614 deaths in London's current ULEZ area, and save over 1,300 days spent in hospital due to NO_2 exposure.[34] Such a reduction would represent c. 1% of all of London's deaths (and 10% of deaths associated with respiratory conditions).[35] Further health benefits would likely accrue from a reduction in instances of cardiovascular disease, lung cancer, low birth weight and Type 2 diabetes, all of which can result from air pollution (more directly from $PM_{2.5}$, but NO_2 will likely also play a role).[36]

30 Excluding the initial ULEZ area, 2019. CBI Economics, '*Breathing life into* London', April 2021. Link

31 CBI Economics, '*Breathing life into Greater Manchester*', April 2021. Link

32 United States Environmental Protection Agency, '*Basic information about* NO_2', 2023. Link

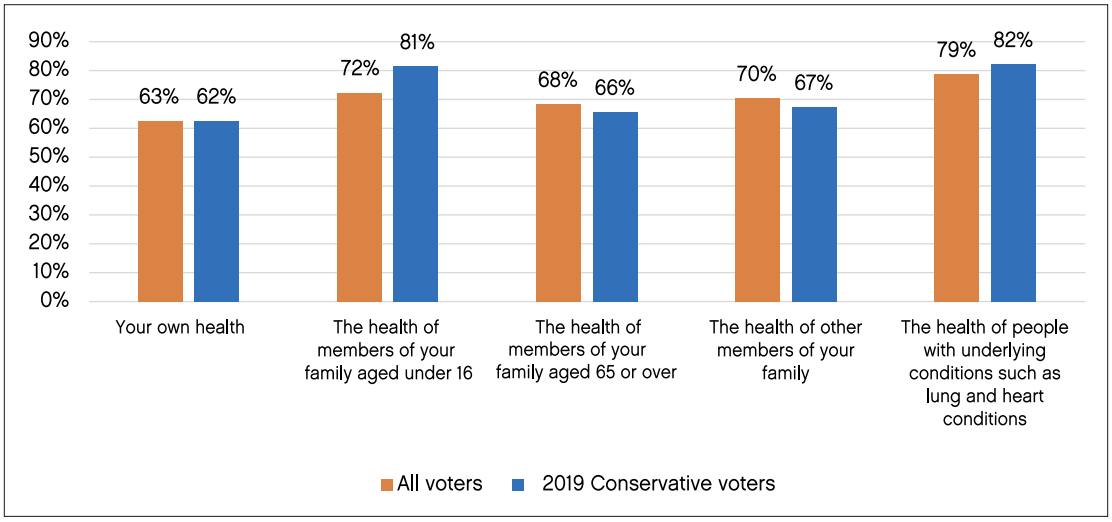
33 CBI Economics, '*Breathing life into Greater Manchester*', April 2021. Link
CBI Economics, '*Breathing life into London*', April 2021. Link
CBI Economics, '*Breathing life into Birmingham*', April 2021. Link

34 CBI Economics, '*Breathing life into London*', April 2021. Link

35 Ibid

36 Ibid

How concerned are you about the effect of air pollution on the following? (Net concerned)[37]



Source: BMG Research/CPS

Voters are clearly concerned about the impact of the UK's dirty air. In our polling by BMG Research, surveying c. 2,100 voters, concern was highest over those with underlying health conditions, followed closely by worry about the young and the elderly.[38]

Moreover, cleaning up the air in the UK's cities would have wider benefits beyond the direct health of its citizens. Reducing hospitalisations and deaths would take pressure off the healthcare system. And cleaning up the air can unlock significant economic gains as well. Although the negative impacts of air pollution fall disproportionately on elderly (non-working) residents, it also harms the health of those of working age. In Greater Manchester, for example, analysis by CBI Economics shows that bringing NO_2 to within legal limits could add 278,000 to 598,000 extra hours worked to the local economy.[39] The effect is even greater for London, adding 1.2m to 2.5m hours.[40]

Given the health problems associated with dirty air, the European Union imposed pollutant emissions standards on new cars in 1992, with the aim of improving air quality. These covered a variety of individual particles, such as carbon monoxide, hydrocarbons, nitrogen oxide and particulate matter. Since Euro 1 was introduced in 1992, the standards have been updated roughly every five years – the latest was Euro 6 in 2015, with the final Euro 7 set to be introduced by 2025.[41]

These standards have largely been a success – for example, carbon monoxide emissions decreased by 63% for petrol vehicles and 82% for diesel between 1993 and 2017, according to the Society of Motor Manufacturers and Traders (SMMT).[42] The group claims that 'it would take 50 new cars today to produce the same amount of pollutant emissions as one vehicle built in the 1970s'.[43]

37 BMG Research polling for CPS
38 Ibid.
39 CBI Economics, '*Breathing life into Greater Manchester*', April 2021. Link
40 CBI Economics, '*Breathing life into London*', April 2021. Link
41 Car Buyer, '*What is the Euro 7 emissions standard?*', 9 March 2022. Link
42 RAC, 'Euro 1 to Euro 6 guide – find out your vehicle's emissions standard', 24 January 2023. Link
43 Ibid.

The next big step in this process, alongside the introduction of tougher legal targets for air pollution, has been the introduction in cities across the UK (and the world) of clean air zones (CAZs). Although they are often seen as being a way to persuade people to drive less, their real purpose is to incentivise drivers of older, more polluting vehicles to upgrade to newer ones that are far less harmful. For petrol vehicles the compliance standard for London's Ultra Low Emissions Zone (ULEZ) is Euro 4, covering cars generally first registered after 2005 (although cars that meet the standards have been available since 2001). This nearly halves the permitted level of NOx relative to Euro 3.[44]

'It would take 50 new cars today to produce the same amount of pollutant emissions as one vehicle built in the 1970s'

For diesel vehicles, the problem of air pollution is even more acute and more urgent. The elephant in the room here, however, is the 'Dieselgate' scandal, which revealed that certain Volkswagen diesel vehicles were intentionally programmed to hide significantly higher emissions of NOx in real world driving than in laboratory testing. Yet even before that story broke, a body of evidence was accumulating showing that diesel vehicles' lower CO_2 emissions were outweighed by their higher air pollutants.

The VW scandal catalysed many governments into changing their diesel-friendly policies.[45] In London, for example, the ULEZ standard for petrol vehicles is Euro 4; but it is the stricter Euro 6 for diesel vehicles, meaning generally that only cars first registered after September 2015 are compliant. (The standards and dates are slightly different for motorcycles and vans.)[46]

Road traffic and congestion

The third and final major issue this report will address is the congested state of Britain's roads – which our polling shows is even more of a concern among voters, with 64% of those we polled saying they were concerned by the amount of traffic in their local area.[47] Levels of concern were similar among drivers and non-drivers – although the former may be more concerned by delays to their journeys, while the latter may have wider concerns about the local impact.[48]

Traffic delays act as a drag on a city's economy and productivity, have knock-on effects for public transportation and air pollution, and of course are a genuine annoyance for many drivers. Polling conducted for this report reveals that 83% of motorists encounter congestion at least from time to time, with 69% saying traffic was 'severe' when driving at peak times.[49]

It can be tempting to think of traffic as a fact of life, but its impact is far more severe than is generally appreciated. Traffic data provider INRIX releases a Global Traffic

44 Ibid. Note the zones are enforced based on the declared emissions of the vehicle relative to the standard (eg Euro 4 NOx) rather than the age.

45 Auto Express, '*Diesel ban? The future of diesel cars in the UK and beyond*', 4 April 2018. Link

46 Transport for London, '*ULEZ standards*', 2023. Link

47 BMG Research polling for CPS

48 Ibid.

49 Ibid.

Scorecard every year, ranking congestion across various countries and cities. The 2019 report (i.e., the last year before Covid) shows that on average, British drivers lost 115 hours every year to congestion, costing the country £7bn overall, or an average of c. £900 per driver.[50] London was the most congested city, with drivers losing 149 hours per year, far higher than the average, causing total damage to the economy of £5bn. This was on a par with Mexico City (158 hours wasted) or Istanbul (150 hours wasted).[51]

'London was the most congested city, with drivers losing 149 hours per year, on a par with Mexico City (158 hours wasted) or Istanbul (150 hours wasted)'

Traffic makes people late for work, deprives them of time with their families and friends, and increases fuel bills.[52] Deliveries can't reach their destinations on time, raising shipping costs and ultimately consumer prices. There can be larger, second-order effects on regional job growth and productivity when traffic gets particularly intense, as jobseekers are dissuaded from looking farther from home, leading to economic inefficiency and stunted labour mobility.[53] These effects will of course vary significantly depending on the location – since congestion is a local issue, so too will be the economic impact.

Traffic also has wider societal impacts beyond the direct monetary cost. Congested road networks make bus journeys longer and less predictable, making it difficult for people to rely on them and hence depressing usage. Bus operator Go-Ahead Group recently told the Transport Select Committee that 'a 10% decrease in bus speeds can reduce patronage by 10% or more'.[54] Vehicles stuck in traffic also contribute significantly to air pollution, both through higher NO_2 emissions from older vehicles and increased $PM_{2.5}$ from all vehicles forced to constantly brake and accelerate. Finally of course there is the psychological cost – most motorists find traffic a genuine source of stress and annoyance in their daily lives. Indeed, our polling found that voters were concerned about traffic not only for its congestion impact, but also that it fed into concerns about air and noise pollution, as well as personal safety.[55] (They were allowed more than one answer, hence the totals coming to more than 100%.)

50 TransportXtra, '*Congestion cost UK economy £6.9 billion in 2019*', March 2020. Link

51 Ibid.

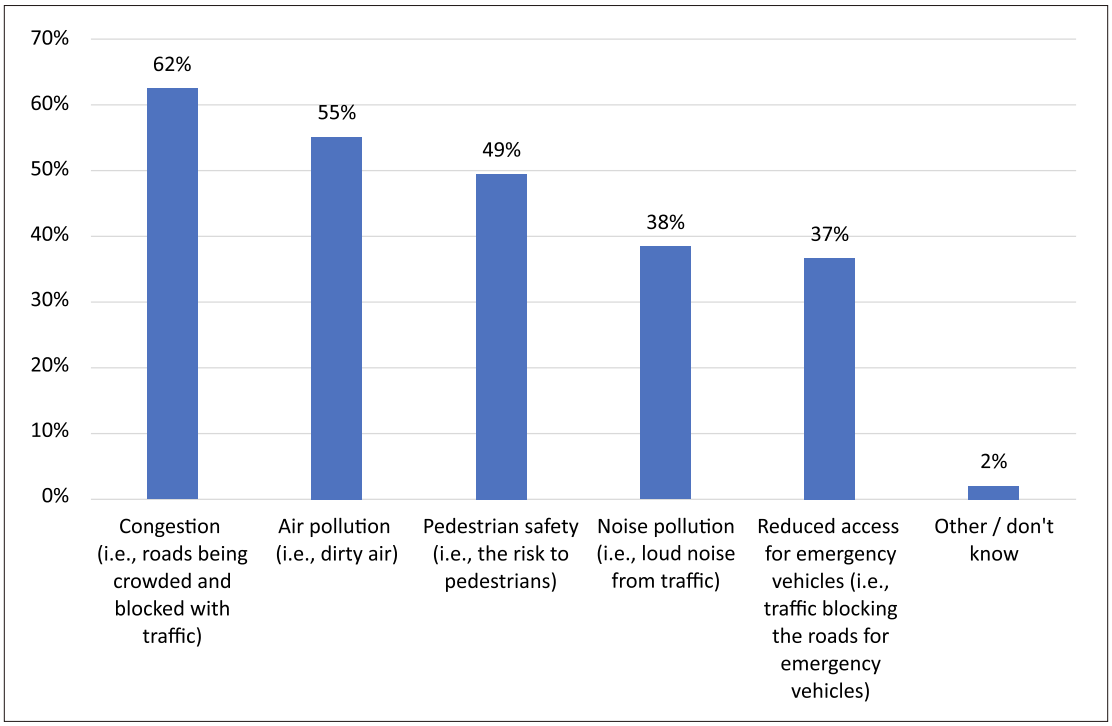
52 INRIX, '*Traffic Congestion to Cost the UK Economy More Than £300 Billion Over the Next 16 Years*', 14 October 2014. Link

53 Bloomberg, *'How Traffic Congestion Affects Economic Growth: For good and bad'*, 22 October 2013. Link

54 House of Commons Transport Committee, '*Road pricing: Fourth Report of Session 2021-22*', February 2022. Link

55 BMG Research polling for CPS

Why are you concerned about traffic in your local area?[56]



Source: BMG Research/CPS

From an economist's point of view, congested roads represent a kind of 'tragedy of the commons', in which an unpriced resource is over-consumed to the point of destruction. Too many people try to use the roads at peak times (since there is no means of regulating access), queues form, and then roads cease to function effectively as thoroughfares that can get people efficiently from A to B.

The fundamental problem is that there is no extra monetary cost to driving when demand is high (at peak times) compared to when demand is low (off-peak times). The roads thus become heavily congested during the morning and evening rush hours, even as they remain relatively free of traffic at other times. Of course, driving at peak times does incur a cost in the form of time wasted (which has real economic impacts), but psychologically most people do not value their time in monetary terms the way economists do.

The most obvious solution is to vary the price people are charged according to when they drive and how full the roads are. However, attempts to solve this problem have so far run aground. As we will see in the next chapter, the Labour Government of the mid-2000s had to abandon its attempt to move towards national congestion pricing: a petition opposing the policy in 2007 gathered more than 1.8 million signatures, and by 2010 the idea had been completely abandoned.[57] The one exception was in London, where the congestion charge introduced by Ken Livingstone in 2003 now charges drivers in central London £15 a day to drive within the zone at peak times, up from £5 when it was first introduced. However, the extension of the zone west of Park Lane was abandoned in 2011 in the face of significant opposition. As a result, while 71% of respondents to our polling said that government needs to do more to tackle traffic congestion, drivers across the vast bulk of the country are effectively being left to ration their own road use.[58]

56 Ibid.

57 House of Commons Library, '*Briefing Paper: Road pricing*', August 2020. Link

58 BMG Research polling for CPS

Chapter 2: The current policy environment

Having outlined the three big policy issues connected with UK motoring, this chapter will summarise what is already being done about each of them as well as the state of public opinion. In two cases, the answer is 'not much'. While many options for reforming road pricing have been proposed, the only concrete step recently has been to remove some of the subsidies for EVs and increase the tax applied. In terms of traffic congestion, London remains the city with the most active and interventionist policy, although other areas such as Greater Cambridge are beginning to follow the capital's lead – but other countries have introduced far more agile and flexible systems. On clean air zones, there has been much more progress, although as we will see their introduction and expansion has not been a straightforward process.

Vehicle taxation and road funding

As described in Chapter 1, the challenge of declining fuel duty receipts because of increased EV ownership has been well publicised, and the Treasury is certainly concerned about it. Indeed, the OBR has publicly declared this to be the largest long-term fiscal issue for the Treasury resulting from the UK's decarbonisation goals under the Net Zero strategy.[59]

> **'The OBR has publicly declared this to be the largest long-term fiscal issue for the Treasury resulting from the UK's decarbonisation goals'**

Last year, the Transport Select Committee produced a report on road pricing that insisted it should be treated as an urgent issue.[60] It recommended the Government set up an arm's-length body to examine proposals and recommend a strategy by the end of 2022. While the Johnson Government did not take this idea on board, the then Prime Minister did acknowledge the fiscal pressures in his appearance before the Liaison Committee in July 2022, observing that 'I think it highly unlikely that the Treasury will let any opportunity go to substitute revenue from motoring.'[61]

Of course, given the current size of the British state, and the fact that only around one third of tax receipts paid by motorists go towards keeping up the road network, it is not necessarily a bad thing that tax receipts will fall. However, in practice it is unlikely that the Government will let such a large chunk of its budget go without a fight, particularly given the (cross-party) march towards an ever-larger state in recent

59 Office for Budget Responsibility, '*What does faster take-up of electric cars mean for tax receipts?*', March 2022. Link

60 House of Commons Transport Committee, '*Road pricing: Fourth Report of Session 2021-22*', February 2022. Link

61 House of Commons Liaison Committee, '*Oral Evidence: The work of the Prime Minister, HC 453*', 6 July 2022. Link Question 97

years. Thus, it is likely that some replacement for this lost revenue will need to be found – and it is probably better to keep at least a portion of it tied to motoring.

Although the cost-of-living crisis makes near-term action on the issue relatively unlikely, the decrease in revenues will only continue over the next few years. The Government will be keen to have a plan in place. Indeed, Jeremy Hunt's Autumn Statement contained an announcement that owners of EVs will have to pay VED from April 2025 onwards. That measure is expected to raise £515m in 2025-26, rising to £1.6bn in 2027-28.[62]

But what might a more comprehensive solution look like? There have been several proposals over the last few years, from a variety of sources.

> **'Some replacement for this lost revenue will need to be found – and it is probably better to keep at least a portion of it tied to motoring'**

At the gradualist end of the spectrum, some have advocated keeping fuel duty and VED in place in their current form and simply creating a new per mile charge for EVs, either for those purchased after a certain date or for all such vehicles. Others, such as 2017 Wolfson prize winner Gergely Raccuja, have suggested replacing fuel duty and VED entirely and charging all vehicles on a per mile basis.[63]

At the most ambitious end of the spectrum, the Transport Select Committee called on the Government to consider replacing the current system with 'a road pricing mechanism that uses telematic technology to charge drivers according to distance driven, factoring in vehicle type and congestion' – in other words, not just a per mile charge but an agile, technology-driven combination of road pricing and congestion charging.[64] This report will engage with the pros and cons of each option in Chapter 4.

Air pollution

As discussed in Chapter 1, the UK has a significant air pollution problem, leading to adverse health impacts for the young and the elderly in particular. Voters are clearly concerned about this issue and want the Government to deliver solutions – according to our polling, 64% of voters believe politicians in the UK have done too little to tackle air pollution, including 53% of Conservative voters.[65]

In response to these concerns, the Government has put in place several initiatives. At the national level, it has established UK-wide statutory limits on air pollution – and while there is still much work to be done, significant progress has been made in recent years.

62 HM Revenue & Customs, '*Policy paper: Introduction of Vehicle Excise Duty for zero emission cars, vans and motorcycles from 2025*', November 2022. Link

63 Raccuja, Gergely, '*Miles Better: A distance-based charge to replace Fuel Duty and VED, collected by insurers*', Wolfson Economics Prize and Policy Exchange, 2017. Link

64 House of Commons Transport Committee, '*Road pricing: Fourth Report of Session 2021-22*', February 2022. Link Paragraph 26

65 BMG Research polling for CPS

However, there are many aspects of air quality (in particular, NO_2 concentrations) that are almost by definition a local issue. Denser, more congested cities have far worse levels of air pollution than rural areas, for example. As a result, the Government has (sensibly) opted to leave the implementation of key schemes to improve air quality to local authorities, rather than imposing a top-down national approach.

Each of the devolved administrations has therefore developed its own strategy, with Defra responsible for England as well as coordinating plans UK-wide. Each council in an area where levels exceed the statutory maximums is required to submit an Air Quality Action Plan laying out steps to remedy the issue to the Government.[66] The national government has provided expertise as well as funding to local authorities via the Air Quality Grant scheme.[67] The Government has also put a statutory requirement on National Highways to work with local councils to deliver cleaner air.[68]

'According to our polling, 64% of voters believe politicians in the UK have done too little to tackle air pollution, including 53% of Conservative voters'

Some cities such as Leeds, Leicester and Coventry have attempted to address air pollution via measures such as improved traffic management, cycle routes and financial support for buses and taxis to upgrade to electric vehicles.[69] However, within road transport the principal policy measure adopted by UK cities has been the introduction of clean air zones (CAZs).

How does a CAZ work?

Put simply, a clean air zone aims to encourage drivers of older, more polluting vehicles to upgrade to newer, cleaner ones within a defined area of high pollution. Older vehicles that were built before more stringent pollutant standards were put in place contribute disproportionately to bad air quality. While over a long period of time these vehicles would eventually leave the roads due to natural attrition, CAZs aim to speed this process up by setting a minimum standard (in London, this is Euro 4 for petrol and Euro 6 for diesel cars).

Which types of vehicles these standards apply to vary significantly. While London's clean air zone covers all vehicles (with very limited exemptions), Manchester's plan (as originally proposed) applied primarily to commercial vehicles, so that only vans, taxis and private hire vehicles, as well as larger vehicles like HGVs and coaches, would be included.[70] In Brighton only buses are subject to CAZ rules.[71]

66 Note that air quality in London is devolved to the Mayor of London. Department for Environment, Food & Rural Affairs, National Highways, and Steve Double MP, '*Package of measures introduced to improve air quality*', August 2022. Link

67 Department for Environment, Food & Rural Affairs, *'Air Quality Grant Scheme'*, Link

68 Department for Environment, Food & Rural Affairs, National Highways, and Steve Double MP, '*Package of measures introduced to improve air quality*', August 2022. Link

69 Fleet News, '*What are the proposed UK Clean Air Zones (CAZ)?*', Link
Coventry City Council, *Air Quality.* Link

70 Clean Air Greater Manchester, '*A new Clean Air Plan*'. Link
See the different classes of clean air zones (A-D) and which cities they apply to here
Note that there are some limited discounts, exemptions and grace periods to ULEZ such as for wheelchair accessible vehicles, taxis, and minibuses used for community transport operated by not-for-profit organisations. Note also that London has a separate clean air scheme for heavy diesel vehicles called the Low Emissions Zone (LEZ).

71 Birghton & Hove City Council, '*Low Emission Zone*'. Link

It is important here to clear up some common misunderstandings about how CAZs function and what their purpose is. Clean air zones are not intended to 'force people out of their cars' – their aim is to nudge drivers to upgrade to cleaner vehicles that do not cause as much air pollution. Nor are they meant to serve as a 'stealth tax' for local governments, designed only to raise revenue – CAZs should be a targeted, specific measure to improve air quality. Indeed, the ultimate aim of the policy is for *nobody to pay the charge*, once all drivers have upgraded to cleaner vehicles and the air quality has improved.

For example, in London, any vehicle that does not meet the standard is charged £12.50 per day to enter the ULEZ (on top of the congestion charge, if applicable). In this way, owners of older vehicles are 'nudged' to upgrade to newer, cleaner ones. Charging drivers is of course a relatively crude way to encourage behavioural change, but the counter-argument is that without some sort of enforcement mechanism there is little incentive for people to upgrade their vehicle.

'The ultimate aim of the policy is for nobody to pay the charge, once all drivers have upgraded to cleaner vehicles and the air quality has improved'

The pricing of a CAZ charge must strike a delicate balance between affordability and effectiveness. The general principle is that paying the CAZ charge should be more expensive than upgrading your vehicle, over a certain period. Taking London's ULEZ as an example, driving a non-compliant vehicle into the zone would rack up charges of c. £3,250 per year for someone commuting in 5 days per week, and £1,300 assuming only 2 days per week. By comparison a used petrol vehicle which meets the standards can be had for £1,000 or less. Older, used vehicles may not be everyone's first choice, of course, but it is certainly a more affordable option than paying frequent ULEZ charges – which is precisely the point.

Not everyone has the means to spend £1,000 upgrading their car – and for lower-income residents who need to drive this can be a source of significant concern. Hence the introduction of scrappage schemes – essentially grants for individuals and businesses to offset the cost of a vehicle upgrade. These are generally targeted at lower-income residents and small businesses (with the appropriate means-testing) and can come as lump-sum payments, contributions to vehicle finance, or both.

In London, for example, residents on benefits such as Universal Credit are entitled to payments of £2,000 to scrap a car. However, the generosity of these schemes is limited by the pot of funding available. In Manchester, this was a significant bone of contention in the negotiations between the Treasury and the Mayor's office – with the Treasury's final offer of £120m for vehicle scrappage deemed unacceptable.[72] In London, the original funding pot was used up after helping to scrap just 13,500 vehicles.[73]

72 The Guardian, '*Campaigners warn against plan to delay Manchester clean air zone*', 13 January 2022. Link

73 Mayor of London, '*92 per cent of vehicles comply with expanded ULEZ one month on*', December 2021. Link

Clean air charges also apply only in a bounded zone. While this is sensible in that it targets the area where the air quality problem is, deciding exactly where to draw the boundaries can be a vexed issue. For example, while there is often general agreement that city centres should be included, deciding which suburban areas or commuter towns and villages should be included can be difficult and generate significant local opposition (as we will discuss in greater detail in Chapter 3). Supporters, however, tend to argue that clean air zones should ideally be expansive enough to cover all vehicles contributing to the problem, rather than shifting the problem to other parts of the city, as drivers of older vehicles avoid affected routes.

The infrastructure necessary to administer a CAZ scheme is also worth highlighting. The most common approach has been to use ANPR cameras set up at strategic points on the edge and within the zone, linking this data with vehicle registrations. While ANPR cameras have the advantage of being tried and tested technology, they are also bulky and expensive.

'In London, residents on benefits such as Universal Credit are entitled to payments of £2,000 to scrap a car'

It is important to point out that CAZs are not the same as congestion pricing, which targets all vehicles in an attempt to reduce traffic. Clean air zones affect only the drivers of older vehicles that contribute disproportionately to the air pollution problem – any petrol vehicle made after 2006, for example, will pay nothing to drive into London's ULEZ.

CAZs across the UK

In the last few years, clean air zones have proliferated across England and Scotland as a result of national government policies. To name but a few, CAZs are in operation or starting soon in London, Bath, Birmingham, Bristol, Bradford, Portsmouth, Sheffield, Glasgow, and Edinburgh.

In many ways, London's ULEZ serves as both a template and a warning for the rest of the UK (and indeed the world). From August 2023, it will cover the vast majority of the city and its outer suburbs, applying to passenger cars as well as commercial vehicles and buses. However, its introduction and recent expansion have not been without controversy, as discussed below.

Some cities have been similarly ambitious in their approach – in Birmingham, for example, the clean air scheme (Brum Breathes) applies everywhere inside the A4540 ring road and to all vehicle types (excluding motorcycles), with an £8 daily charge for cars.[74] Other cities have opted to take a different approach to both the types of vehicles charged and the area where the zone will apply. In Bradford, for example, the scheme (Breathe Better Bradford) excludes passenger cars and motorbikes but includes all other vehicle types and applies to both the central city (inside the A6177 ring road) and the Aire valley corridor.[75] Portsmouth has taken a more limited approach in its scheme (Cleaner Air Portsmouth), excluding passenger cars, motorcycles and vans and restricting the application of the zone to a relatively limited area (3km^2) in the south west of the city.[76]

74 BrumBreathes, '*Charges and operation*'. Link

75 Breathe Better Bradford, '*Where is the Clean Air Zone?*'. Link

76 Cleaner Air Portsmouth, '*Vehicle Drivers: Clean Air Zone*'. Link

Scotland, meanwhile, has taken a more hardline approach to charging non-compliant vehicles, opting for a steep penalty charge of £60 (reduced by 50% if paid within 14 days) that doubles continually after each subsequent entry in a 90-day period. In contrast to the daily charges in operation in England, which are meant to nudge, this is a far stronger price signal to residents to upgrade their vehicles. In Glasgow and Edinburgh, the LEZs (Low Emissions Zones) apply to all vehicles except for motorcycles, although their application is restricted to a relatively limited area of the city centres.[77] Grace periods have also been implemented for 1-2 years before charging begins, to give residents time to adjust.

'When given a definition, 62% of respondents supported the introduction of CAZs, against only 15% who were opposed'

Another tough approach can be seen in Oxford, which has introduced the UK's first Zero Emissions Zone, albeit on a pilot basis. The scheme would charge drivers of not just older vehicles but of any non-zero emissions vehicles up to £10 per day to drive through the centre of Oxford, with drivers encouraged to park on the outskirts of the city and take shuttle buses into the centre.[78] The Council's aim is both to clean up Oxford's air and to reduce carbon emissions, as the Council has set its own Zero Carbon by 2040 target.[79]

Polling suggests voters support clean air zones

With the proliferation of clean air zones across the UK in recent years, polling suggests that 82% of voters are aware of CAZs – although only 37% report knowing a fair amount or a great deal about them, relative to 45% who had heard the name but did not know what they are.[80] This would suggest that at least for a significant segment of voters, more work is needed in terms of information and education.

In a similar vein, in our polling there were sizeable minorities of respondents who either believed their car was compliant when it in fact was likely not, and vice versa – again suggesting a lack of information.[81] Still, when given a definition, 62% of respondents supported the introduction of CAZs, against only 15% who were opposed. This holds true for 2019 Conservative voters too: 60% support vs 19% opposed.[82] Even among respondents who believe their main vehicle was unlikely to meet the clean air standards, 60% supported the policy vs 24% who were opposed.[83]

77 Glasgow City Council, '*Glasgow's Low Emission Zone (LEZ) - Key Information*'. Link
The City of Edinburgh Council, '*Low Emission Zone (LEZ): How it works*'. Link

78 Oxfordshire County Council, '*About Oxford's zero emission zone (ZEZ)*'. Link
Bloomberg UK, '*A Test for Congestion Charges in Smaller Cities*', 30 March 2022. Link

79 Ibid

80 BMG Research polling for CPS

81 Ibid.

82 Ibid. Prompt: A Clean Air Zone is an area where drivers of vehicles that cause higher levels of air pollution are encouraged to upgrade to cleaner ones, and those that don't are charged to enter. To what extent do you support or oppose the introduction of Clean Air Zones in the UK?

83 Ibid.

Furthermore, when asked explicitly about support for charging non-compliant vehicles (in places where air quality is particularly bad), 50% of respondents were supportive (rising to 56% of Conservatives), against only 19% who were opposed.[84]

Similarly, in our focus groups, clean air zones received generally positive receptions – participants understood and agreed with the goal of cleaning up the air. As one commented, 'I like this. Sometimes you can be driving and you smell the exhaust from an older car and you're like, "that car shouldn't be on the road"'.

'In our focus groups, clean air zones received generally positive receptions – participants understood and agreed with the goal of cleaning up the air. As one commented, 'I like this. Sometimes you can be driving and you smell the exhaust from an older car and you're like, 'that car shouldn't be on the road''

Nevertheless, the introduction of CAZs across the country has not been without controversy. Some, in fact, are very strongly opposed. Chapter 3 will consider in more detail how well the CAZs are working, the arguments made against them, and how to design clean air zones in a way that keeps voters onside.

Road traffic and congestion

More than half a century ago, the British traffic expert RJ Smeed made a depressing prediction: that traffic in central London was doomed to be sluggish in the absence of external disincentives to drive. Sure enough, traffic speeds have remained low for decades, as population growth, increasing net migration and rising standards of living have led to ever more cars on our roads.

Smeed's solution, set out in a report for the government in 1964, was congestion pricing – the idea that by charging people to drive at peak times, a large number of people will shift their journeys to other times of the day, or take public transport or avoid travelling entirely. With fewer vehicles on the roads at peak times, speeds will increase across the board as journeys will be more evenly distributed across the day.

The devil is, of course, in the detail. Agreeing how much to charge, at what times of day, in which locations, how vehicles will be tracked, and how to allay privacy concerns are all highly contentious issues. Moreover, congestion charging represents a fundamental psychological shift in the relationship between motorists and the roads they drive on. For these reasons such policies have been regarded by many governments as politically unfeasible.

In the mid-2000s, the then Secretary of State for Transport, Alistair Darling, commissioned a study to examine the feasibility of congestion pricing, as part of a wholesale reform of motoring taxation. In a statement to the House in 2004, Mr Darling said:

> The study concludes that a national scheme has the potential to cut congestion by about half, as well as providing environmental benefits. It says that road pricing will become technically feasible in the next 10 to 15 years;

84 Ibid. Prompt: Thinking about places where the air quality is particularly bad, to what extent would you support or oppose the following? The Government charging those with more polluting vehicles who don't change their vehicle after being given the opportunity and incentives to do so

> but, for a scheme to work, it would need general public acceptance and a great deal of preparation work over a number of years. There is still a lot of work to be done before we could be sure whether that could work, but one thing is clear: doing nothing would be the worst possible option.[85]

The proposal continued to gain steam with a series of further reports. By 2006 the government seemed keen to move towards a system of congestion pricing (once the technology was ready) and introduced a Local Transport Bill intended to 'help to pave the way for a national road-pricing scheme in the medium to long term'.[86]

'In London, the congestion charge has not only survived but has increased from an initial £5 to £15'

However, as mentioned above, the proposals generated significant backlash among the general public. Privacy was seen as a key issue, with motorists wary of the state tracking their movements constantly. Another major concern was that the average driver didn't have the option of shifting their journeys, with many people having to commute for work and public transport not a realistic option in many parts of the country. Fundamentally, people were worried that the proposal would lead to higher bills but no change in traffic speeds.

The Conservatives opposed the policy vociferously and the *Telegraph* launched a campaign against it.[87] A petition was launched on the Downing Street website asking government to 'scrap the planned vehicle tracking and road pricing policy'. It gathered over 1.8 million signatures by the time it closed in early 2007.[88] As a result, Labour's commitment began to soften, and by 2010 the policy had been completely dropped. National congestion pricing was dead.

London's congestion charge

Yet in London, congestion pricing was already a reality. Ken Livingstone had introduced a congestion charging zone in 2003. The plan to extend it westward to Kensington and Chelsea was scrapped in 2011 by Boris Johnson, after many residents objected, as was Livingstone's proposal to vary the charge based on the CO_2 emissions profile of the vehicle.[89] But overall, the charge has not only survived but has increased from an initial £5 up to £15.

But how effective has it been?

The scheme was inspired by Singapore's Electronic Road Pricing (ERP) system (discussed further below) and designed with the explicit aim of reducing traffic, thereby increasing the speed of passenger vehicles and buses and improving the quality of life in central London.

85 House of Commons Library, '*Briefing Paper: Road pricing*', August 2020. Link

86 The Telegraph, '*Labour to scrap national road pricing plans*', 15 October 2007. Link

87 Ibid.

88 House of Commons Library, '*Briefing Paper: Road pricing*', August 2020. Link

89 Transport for London, '*Mayor confirms removal of Congestion Charge Western Extension Zone by Christmas and introduction of CC Auto Pay in New Year*', October 2010. Link
BBC News, '*Mayor quashes £25 C-charge hike*', 8 July 2008. Link

The zone operates in the dense core of central London (see map below), where the streets are often narrow and traffic can get easily get quite clogged up. Unlike clean air schemes such as ULEZ, the congestion charge only operates at certain times – currently 7am-6pm Monday to Friday and 12pm-6pm on weekends and bank holidays. Drivers are charged £15 per day to drive within the zone, but once charged are free to drive wherever they please. Tracking vehicles is administered via ANPR cameras, with drivers debited directly if they are registered with a TfL account. There are some notable discounts and exemptions to the charge, including for residents, electric or hydrogen vehicles (until 2025), taxis, and buses.[90]

London's congestion pricing zone[91]

Source: Transport for London

A key selling point of the scheme was that congestion charging was paired with significant improvements in public transport. On the day the charge was brought in, 300 extra buses were added to the network in Central London.[92]

According to Christina Calderato, director of transport strategy and policy at Transport for London (TfL), 'When it was originally implemented, you saw the impacts of it happening overnight and then those impacts embedded. So immediately, we saw a 15 per cent reduction in circulating traffic and a 30 per cent reduction in congestion. Over time that has been maintained.'[93] While average speeds in the capital remain sluggish, TfL believes they would be even worse today without the charging scheme.[94]

90 Transport for London, '*Congestion Charge: Discounts and exemptions*'. Link

91 Transport for London, '*Congestion Charge: Congestion Charge zone*. Link

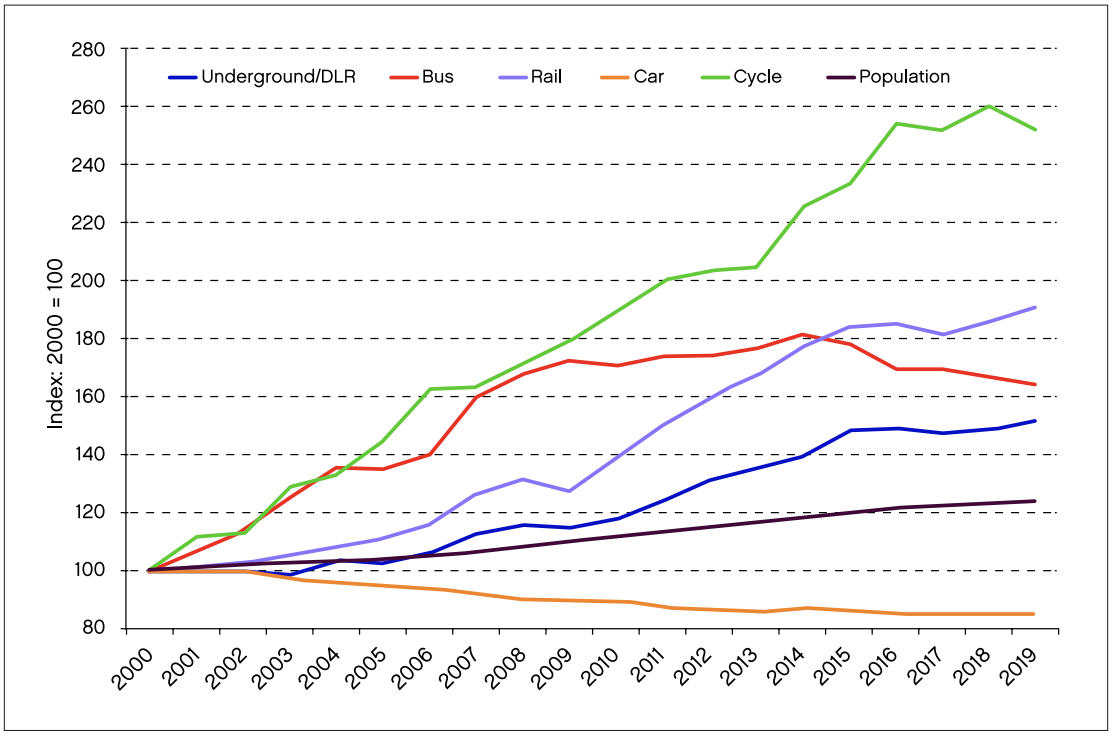
92 BBC News, '*First congestion fines to go out*', 18 February 2003. Link

93 Auto Express, *'London Congestion Charge: 20-year anniversary, map, times, exemptions and full details'*, 17 February 2023. Link

94 Ibid.
The Conversation, '*London congestion charge: what worked, what didn't, what next*', 2 March 2018. Link

More broadly the congestion charge (alongside other measures) has engendered a significant modal shift. By 2019, trips by private car were 15% below 2000 levels, while the Tube, cycle, bus and rail all saw significant growth, over and above population growth (see below).

Comparison of transport modes in London, 2000-2019[95]



Source: Transport for London

Moving beyond London, there are not many successful examples of congestion charging being introduced. In the 2000s, there was an attempt to introduce a scheme in Greater Manchester – but it wound up being defeated in a local referendum with 79% opposed.[96]

Greater Cambridge has recently proposed introducing a congestion charge, as part of a wider transformation of the area's transport infrastructure.[97] While still preliminary, the current plans would see a £5 charge levied on cars driving within urban Cambridge between 7am and 7pm on weekdays, with higher charges for heavier vehicles.

In a nod to hypothecation, the consultation pledges that 'money raised would fund improvements to the bus network and other sustainable travel schemes'.[98] As in London, the 'carrot' to be introduced alongside the charging zone is significantly improved bus services, with £1-£2 fares, more routes, increased frequencies, and of course faster journey times given reduced congestion. While people on low incomes would receive tapered discounts of 25-100% (in addition to the usual exemptions for emergency vehicles and the like), there would be no residents' discount as exists in London.

95 Transport for London, '*Travel in London: Report* 13', 2020. Link Page 58 (Figure 2.9)
96 The Guardian, '*Manchester says no to congestion charging*', 12 December 2008. Link
97 Greater Cambridge Partnership, '*GCP Making Connections 2022*', Autumn 2022. Link
98 Ibid.

The Greater Cambridge Partnership believe these changes could reduce congestion by up to 50%. However, while many in the area have supported the plans, not everyone is convinced. There has been vocal opposition from some residents and political leaders concerned about the impact of the charges.[99]

Beyond London and Cambridge, there is widespread theoretical support for greater action on congestion. Polling conducted for this report reveals that 71% of respondents believe that government needs to do more to tackle traffic congestion (even among those who don't drive, 68% agreed).[100] Eight-five per cent of respondents had heard of congestion charging zones, and when given an explanation of the policy, 47% supported it, relative to 25% who were neutral and 24% who opposed.[101] When asked more broadly about 'charging people that drive at peak times as a way to reduce congestion' (without specifically mentioning zones), support rose to 53%.[102] These results suggest both a relatively widespread level of (at least generalised) support for congestion charging, as well as a significant portion who are neutral now and may be able to be convinced.

> **'Eight-five per cent of respondents had heard of congestion charging zones, and when given an explanation of the policy, 47% supported it, relative to 25% who were neutral and 24% who opposed'**

Our focus groups concurred that congestion was a real issue in their daily lives, and several participants supported charging zones as a solution. As one commented, 'I'm quite happy for it to have a congestion charge … I've been in Manchester at peak times and I do think if there's a way for people not to travel in peak times it should be introduced, even if it hurts them in the pocket.'

However, many participants also voiced concerns about congestion charging's effectiveness. In particular, the London groups (who have direct experience with the congestion charge) had a strong perception that because congestion was still an issue in London, the policy was ineffective. As one participant said, 'I don't think it's made much difference because you pay and you're still in traffic.'

Another common concern was that charges are unfair on those who have to drive at certain times (particularly for work), as well as those on lower incomes. Relatedly, many participants felt strongly that improving public transport was the other side of the congestion charging coin – as one commented, 'something needs to be done but [charging] is just a stick, you also need a carrot [improving public transport]'.

These experiences suggest that while congestion is seen as a real issue and charging could be a viable solution, the public are keen to see more nuanced policies that incorporate means testing and more investment in public transport. The realisation of faster average speeds on the roads is also (understandably) vitally important to people's daily lives, which is something that could be brought about by more advanced charging systems.

99 BBC News, '*Cambridge congestion charge: MPs clash in BBC Politics East debate*', 5 February 2023. Link

100 BMG Research polling for CPS

101 Ibid. Question: A congestion charging zone is a zone where all drivers (regardless of vehicle type) are charged a fee to enter during peak times in order to reduce traffic congestion and increase speed. To what extent do you support or oppose the use of Congestion Charging Zones in your local area?

102 Ibid.

How would more advanced congestion charging work?

If London or other cities in the UK wanted to go further on reducing congestion, what might a more advanced scheme look like? The gold standard right now is Singapore's ERP scheme, which explicitly sets optimal speed ranges and varies the charges levied on drivers to match this. The government monitors speeds on individual (targeted) roads and regularly reviews the charges to ensure they are appropriate – too slow and the charge is increased, and vice versa.

However, Singapore's system was first introduced in 1998, and hence relies on relatively old technology. New, next generation systems being considered in Singapore and around the world would aim to go further. Vehicle tracking, enabled either by smartphones or an in-vehicle black box, would allow for far more precise and tailored user charging. In London, rather than a flat charge applying over a huge area throughout the day, one could vary the charge so that the most traffic-clogged roads at the worst times were targeted.

> **'The Singaporean government explicitly sets an optimal traffic speed for each road, and charges are reviewed every few months to ensure that desired speeds are being achieved. If traffic speeds rise above the optimal level at any given point, the charge is decreased, and vice versa'**

At the most ambitious end of the spectrum is 'dynamic' charging. Imagine getting into your car and inputting your destination (say via Google Maps) – the software would give you a choice of routes, with different price levels. The quickest route might shave 15 minutes off your journey but would cost more, whereas quieter and more indirect routes would save you money. The beauty of such a system is that charges could be varied in real time to respond to traffic conditions, shifting demand to match supply and enabling far more efficient and speedier utilisation of the roads.

Such systems are technologically relatively achievable – what is needed is the political will and public acceptance. To that end, our polling indicates that dynamic systems are more popular than conventional wisdom would suggest – when given a definition, 48% of respondents supported their introduction, against 20% who were opposed.[103]

By contrast, in our focus groups dynamic charging proved relatively unpopular, with participants particularly focusing on the practical challenges of implementing such a system (accommodating deviations from a pre-paid route, for example). While in our view none of the challenges raised were insurmountable, it is important to note that a fully dynamic charging system is likely a much longer-term goal than any of the other policies discussed in this report. The advent of autonomous driving will be a key enabler for this sort of system, both allowing for quicker decision making and minimizing the amount of human input required.

Singapore Electronic Road Pricing (ERP) system
Singapore's ERP scheme aims to control traffic speed through the Central Business District (the densest bit of downtown Singapore) via a system of gantries set up at strategic points. All vehicles are required to have an onboard unit installed that

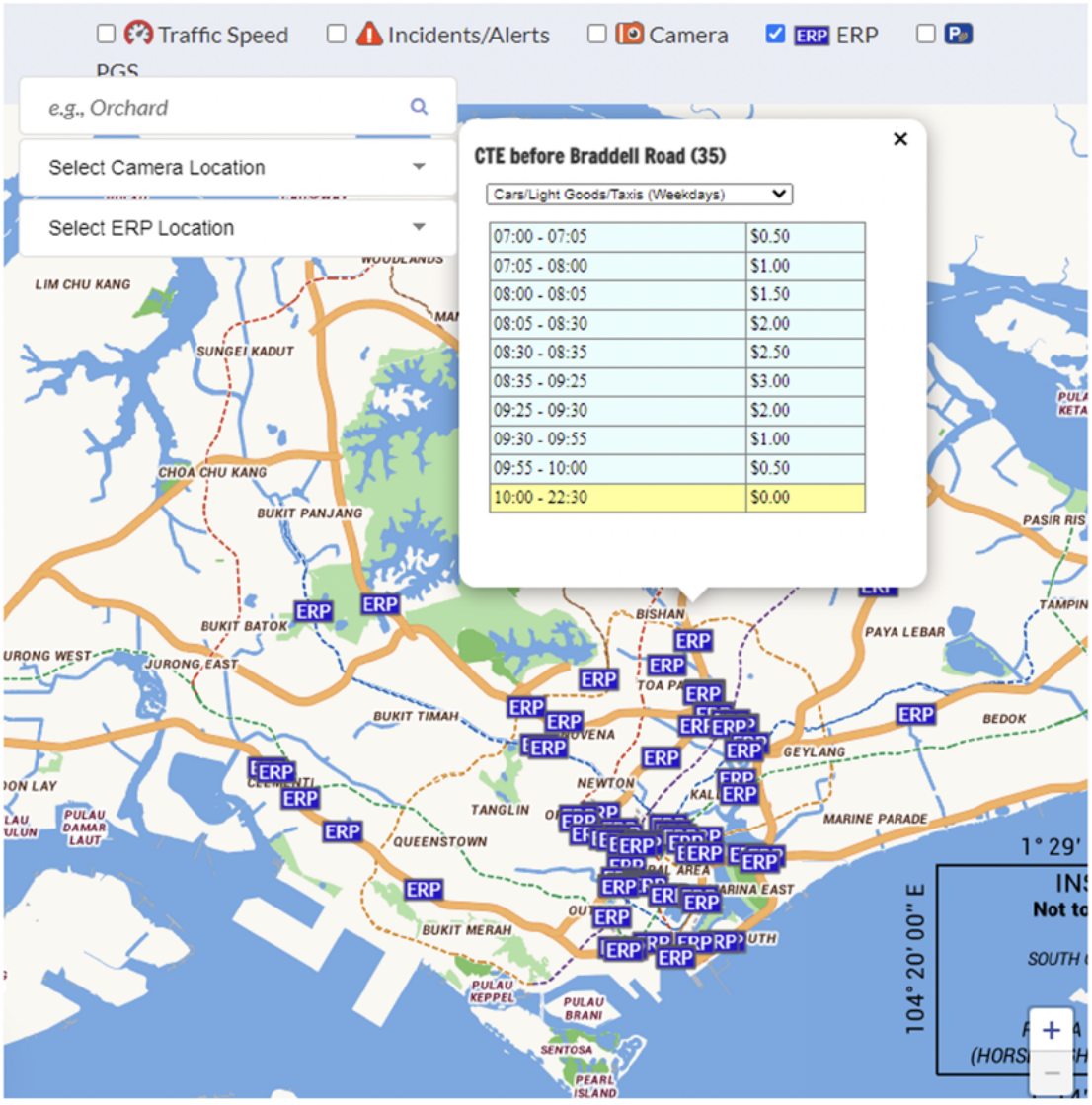
103 Ibid. Prompt: A 'dynamic' charging system would involve changing rates in real time based on traffic conditions, with higher charges to drive when there are higher traffic levels, and a lower charge when there are lower traffic levels. The system would aim to reduce congestion and improve journey times. To what extent would you support or oppose the introduction of a 'dynamic' charging system like this?

charges drivers automatically as they pass the relevant gantry. In contrast to London and other more basic systems, which have a single charge to drive into a defined zone, in Singapore each gantry is associated with an individual variable charge. These charges are priced in 30-minute minimum increments, which vary across the day – higher at rush hour and lower in the middle of the day and at night.

The Singaporean government explicitly sets an optimal traffic speed for each road (45-65km/h on expressways and 20-30km/h on arterial roads).[104] At each location, daily traffic volumes and speeds are monitored, and charges are reviewed every few months to ensure that desired speeds are being achieved. If traffic speeds rise above the optimal level at any given point, the charge is decreased, and vice versa.

An interactive map on the government website displays the charges in any given location (see below). Given the predictability of the charges over a multi-month period, drivers can modify their behaviour accordingly and hence speeds can be altered effectively.

Example of ERP pricing in Singapore[105]



Source: Singapore Ministry of Transport

104 OneMotoring (Singapore Ministry of Transport), '*Electronic Road Pricing (ERP)*'. Link
105 Ibid.

Yet Singapore is not resting on its laurels. The system still leads the world. But it was first introduced in 1998 and hence relies on relatively outdated technology (the overhead gantries) that is expensive to maintain. The government will therefore be introducing a new system, dubbed 'ERP2', which will take advantage of GPS technology to enable distance-based road pricing. As the government describes it, 'This will be more equitable than the current system, which charges all motorists the same amount as long as they pass a gantry, regardless of the distance they travel on the congested road.'[106]

106 Singapore Ministry of Transport, '*Electronic Road Pricing (ERP): How ERP works as a speed booster*', March 2022. Link

Chapter 3: The lessons of clean air zones

For policymakers, transport professionals and even average citizens, there is a commonly held sentiment that progress on road transport policy is measured in inches rather than miles and that reforms are perpetually ten years away.

Yet as we have seen, there is one area of motoring taxation where there really is a lot of policy innovation going on, in multiple parts of the country – clean air zones.

> **'There is one area of motoring taxation where there really is a lot of policy innovation going on, in multiple parts of the country – clean air zones'**

While CAZs obviously have a particular aim (cutting air pollution rather than raising revenue or reducing congestion), there are many commonalities with road pricing. Individual drivers are forced to reckon with the externalities of their driving and new ways of paying for their usage of the roads, while local authorities must grapple with difficult conversations with voters as well as new infrastructure such as ANPR cameras. There are therefore many lessons to be drawn from the experience of implementing CAZs for any wider charging or congestion schemes.

In this chapter, we will discuss how CAZs have operated in practice, explore some of the common problems local authorities have encountered, and set out the key policy lessons. Then, in the final chapter, we will discuss how these lessons can be applied to future per mile charging and congestion schemes in order to build better, more durable policies.

London – problems and successes

The first thing to say about London's ULEZ – which you do not actually often hear – is that judged strictly by its own lights, it has been extremely successful.

As the table on the following page shows, when the ULEZ was announced in 2017 (with the earlier T-charge that was less restrictive), only 39% of vehicles driving in the zone were compliant with the standards.[107] By late 2021, when the zone was expanded to the North and South Circular, the compliance rate had jumped by nearly 50 percentage points (pp), and rose further thereafter.

107 Mayor of London, '*92 per cent of vehicles comply with expanded ULEZ one month on*', December 2021. Link

Compliance rates in London's ULEZ[108]

In zone compliance	February 2017 (announcement of ULEZ and start of T-charge in central London later that year)	October 2021 (just prior to expansion of ULEZ)	First month of the expanded ULEZ, 18 times original size)
% compliant	39%	87%	92%
% non-compliant	61%	13%	8%

Source: Mayor of London

The effect of the ULEZ standards extends beyond the borders of the zone itself. Comparing the four weeks before the expansion of the ULEZ zone in late 2021 to the four weeks after (below), compliance inside the zone rose by 4.8pp, while compliance on the boundary roads rose by 4.1pp and outside of the zone by 1.9pp.[109] This indicates that the ULEZ standards act as a 'multiplier' on the surrounding area – which makes sense as motorists who live outside of the zone may on occasion drive into it, and hence need to be aware of the vehicle standards.

Comparison of compliance rates by geography in London's ULEZ[110]

Date	Inside the Zone	Boundary Roads	Outside the zone
October 2021 (prior to launch)§	86.9%	83.7%	80.4%
First month of operation†	91.8%	87.8%	82.2%
Change	▲ 4.8 percentage points	▲ 4.1 percentage points	▲ 1.9 percentage points

Source: Mayor of London

So the ULEZ appears to have achieved one basic objective, which is cutting the number of journeys within the zone by more polluting vehicles, and hopefully improving London's air quality in the process.

Nor do these increases in compliance rates appear to be the result of drivers of older vehicles being forced out of their cars and on to public transport. As the table on the following page shows, while the introduction of the expanded ULEZ zone led to a decrease in drivers of non-compliant vehicles, it also corresponds to an increase in drivers of *compliant* vehicles, leaving the total number of cars on the road essentially flat (albeit over a two month period).[111] This suggests that the introduction of the ULEZ may have had the desired effect of nudging motorists to upgrade their vehicles to newer, cleaner models. (Obviously, there will have been an element of natural turnover here, as people replace their vehicles anyway. But it is hard to see that accounting for such a steep rise in the proportion of compliant vehicles.)

108 Ibid.

109 Mayor of London, '*Expanded Ultra Low Emission Zone – First Month Report*', December 2021. Link Page 12

110 Ibid.

111 Mayor of London, '*92 per cent of vehicles comply with expanded ULEZ one month on*', December 2021. Link

Vehicle traffic numbers before and after the ULEZ expansion[112]

Date	Number of compliant vehicles (weekday average)	Number of non-compliant vehicles (weekday average)	Total Number of vehicles (weekday average)	Number of compliant vehicles (weekday average)	Number of non-compliant vehicles (weekday average)	Total Number of vehicles (weekday average)
October 2021	837,000	127,000	964,000	795,000	108,000	903,000
Post launch	872,000	80,000	953,000	829,000	70,000	898,000
Change	▲36,000 4% Increase	▼47,000 37% reduction	▼11,000 1% reduction	▲34,000 4% Increase	▼38,000 35% reduction	▼5,000 0.5% reduction

Source: Mayor of London

And the ULEZ does seem to have had an effect on air quality too. While the ULEZ has only been in operation for a short period of time, the Greater London Authority issued an Air Quality Impact Evaluation in 2020 that assessed the directly attributable impact of the ULEZ (in the first two months of 2020) to be a reduction of 37% in NO_2 concentrations at roadside locations in central London.[113] That said, a subsequent scientific study found a much smaller effect (an average reduction of less than 3% for NO_2 concentrations), although this used a different research design and focused only on the ULEZ itself rather than the prior T-charge.[114] Still, it seems reasonable to assume that removing older, more polluting cars from the road will contribute to improved air quality over time.

However, in recent months the ULEZ has also become something of a political football. The Mayor of London has committed to a huge expansion of the ULEZ area to cover the whole of Outer London, to come into effect in August 2023.[115] This has been opposed not just by many local residents but by the boroughs affected.[116] The central objection is that not only is the air cleaner in the outer boroughs, but that there is nothing like the level of public transport provision that there is in the city centre, meaning that this will further punish households already affected by the cost of living crisis. Several local councils have fought the expansion decision in the courts, with councillors declaring it a 'socially regressive tax' under the cover of 'a false health scare over air quality'.[117] Local residents have also made their objections known, vandalising ULEZ cameras with wires cut and lenses painted black.[118]

112 Ibid.

113 Greater London Authority, *Air Quality In London 2016-2020: London Environment Strategy: Air Quality Impact Evaluation*, October 2020. Link

114 Ma et al, '*Has the ultra low emission zone in London improved air quality?*', Environmental Research Letters, Volume 16 Number 12, November 2021. Link

115 Transport for London, '*ULEZ Expansion 2023*'. Link

116 The Evening Standard, '*London suburbs in revolt over Sadiq Khan's Ulez expansion*', 19 January 2023. Link

117 London Borough of Bromley, '*Councils challenge ULEZ expansion decision in the courts*', February 2023. Link

118 Daily Mail, '*Newly installed ULEZ cameras are vandalised with wires cut and lenses painted black amid growing backlash at Sadiq Khan's planned expansion of the zone*', 9 March 2023. Link

We will discuss these objections further below, but it is worth pointing out that London is not the only place where a CAZ, while popular in theory, has become the focal point of vocal discontent.

Like many cities in England, Manchester has a serious NO_2 problem, with exceedances above the legal limit in all 10 boroughs of the city-region. A ministerial direction issued in 2019 required Greater Manchester to draw up plans for a charging CAZ scheme covering the whole region, designed to bring road-related air pollution in line with legal limits by 2024.[119] From the start the scheme excluded private cars, applying only to lorries, buses and coaches which did not meet the emissions standards (charged £60 per day) and vans, taxis and private hire vehicles (£7.50 per day).[120]

Nevertheless, the scheme incurred increasingly fierce local opposition in late 2021 and early 2022 – the *Manchester Evening News* called it 'one of the most divisive political issues in Greater Manchester in recent months'.[121] As happened with the previous attempt to introduce congestion charging in the area, campaign groups were quickly formed, while mayor Andy Burnham's radio appearances were 'flooded with furious callers'.[122] In early 2022, the scheme was put on hold and the deadline to bring air pollution into line pushed to 2026.[123] The future of Manchester's CAZ remains up in the air, with the Mayor's office pushing for a non-charging scheme and the Government still assessing the plans.

Protestors in Manchester[124]

Source: Manchester Evening News

119 Manchester Evening News, '*Six weeks until new Clean Air Zone plan - what happens next and what it means*', 23 May 2022. Link

120 Ibid.

121 Ibid

122 Ibid

123 Manchester Evening News, '*One year on from the Clean Air Zone being paused, where are we now?*', 20 February 2023. Link

124 Ibid.

Why do people oppose CAZs?

If we want to tackle air pollution, CAZs are an obvious and attractive route. But we need to understand why people have opposed them, and how to address those concerns, if we are not to see the Manchester and London experiences repeated. The similar rows over low-traffic neighbourhoods (LTNs) confirm that road transport policy can be a hugely emotive issue. So what are the main objections? And how can we address them?

The perception of stealth taxation/a war on motorists

Clean air schemes are often derided as 'stealth taxes' that are simply designed to raise revenue, and/or as an ideologically driven attempt to force people out of their cars. While neither of these criticisms are valid from a policy perspective (again, the ultimate aim of clean air zones is for *nobody* to pay the charge), one can understand how these perceptions crop up. Fuel duty, another motoring tax, is indeed an explicit revenue raiser, with the funds spent across the whole of government and not hypothecated to roads or transport in any way. And the fact that ULEZ, for example, raised £225m last year (and £111m on a net basis) has not exactly dampened people's suspicions that this is simply a tax by another name.[125]

> **'While an economist would argue that price signals alone are enough to drive behavioural change, one can see how the perception crops up that this is simply another tax'**

Another significant issue is communication of the policy. Take London: when the ULEZ was first introduced, TfL conducted a large public information campaign that focused strongly on cleaner air as the ultimate goal. The lefthand image on the following page is a poster from that campaign – children (who suffer disproportionately from dirty air) in the background, while in the foreground the text mentions cleaner air or breathing three times.

Compare this to the right-hand image from the 2021 ULEZ expansion – which massively increased the ULEZ zone to 18 times the original area, covering 4 million people (over a third of London's population).[126] A picture of London with a blue sky, with a sign saying ULEZ is expanding and asking drivers to 'check their vehicle'. To the average person who has never heard of the policy, this means nothing. Even the name ULEZ is simply another acronym for the average Londoner to learn and mentions nothing about clean air.

While an economist would argue that price signals alone are enough to drive behavioural change (which ULEZ has certainly succeeded in doing), one can see how the perception crops up that this is simply another tax or trying to force people out of their cars, rather than a policy to improve air pollution.

125 SW Londoner, '*ULEZ gross income rises to £226 million in 2022*', 18 January 2023. Link

126 Mayor of London, '*Expanded Ultra Low Emission Zone – First Month Report*', December 2021. Link

Comparison of TfL posters promoting ULEZ[127]

Source: Transport for London

Another misperception that can often crop up relates to who exactly will be charged. As discussed in Chapter 2, CAZs in the UK range vary widely in terms of which types of vehicles are charged. While in Birmingham and London, the CAZ applies to nearly all vehicles, in other cities the charges are levied only on heavier vehicles. This can cause significant confusion in some cases.

In Manchester, for example, the zone was never meant to apply to private passenger vehicles – only to taxis, private hire vehicles, and heavier vehicles like buses and lorries. But many individual drivers seemed to believe they would be paying, and began to man the barricades accordingly.

CAZs as regressive

Another counterargument is that by designating one flat charge for all drivers, CAZs are regressive. Rich drivers can simply pay the charge and keep driving their polluting vehicles, while poorer drivers will be forced to pick up the tab for a new car and shoulder the burden of the policy – or carry on driving their old car, and pay disproportionately more of their income. Those on lower incomes are probably also more likely to be doing the kind of work that cannot be done remotely.

Any flat-rate charge will indeed weigh most heavily on those with the lowest incomes. (The same, of course, is true of vehicle excise duty and the London congestion charge.) However, there are two important caveats to keep in mind. One is that while the charges are flat, the policy 'fix' designed to ensure the burden does not fall on the poorest is a scrappage scheme (discussed further below) which may itself be

127 See here and here

means-tested. The other is that as the data from London's ULEZ shows, the charges for non-compliant vehicles are substantial enough to be felt even by the relatively well-off.

It is interesting to compare this approach to the penalty charging in Scotland. While the latter is far harsher medicine and risks angering drivers of vehicles which are effectively banned, it is (bizarrely in our view) perceived by some to be a fairer approach. By structuring the scheme as a ban with penalty charges rather than a daily charge, a different perception is created. The psychological narrative is (presumably) that the rules are the same for everyone, rich or poor. No one is meant to be driving non-compliant vehicles, and those who violate this rule are subject to a penalty charge. Whereas in England a daily charge on non-compliant vehicles creates the impression of a tax that the rich can afford to pay, compared to the poor who cannot bear it.

Inadequacy of scrappage schemes

Another critique that comes up in discussions of CAZ implementation is the inadequacy of scrappage schemes, from several perspectives. First, there is usually a very limited pot of funding available relative to the number of people who need it – in London's first iteration of the ULEZ, the money ran out after approximately 13,500 vehicles had been able to use the scheme.[128] In Manchester, despite the Treasury offering £120m, Andy Burnham felt this was too little to cover all those who would need it.[129]

> **'As one of the participants in our London focus groups commented, 'I doubt whether they're actually that bothered about emissions, I suspect it's a money raising scheme. If they were bothered about emissions they would provide a lot more money to people to help upgrade their vehicles'.'**

Second, the funding amount per vehicle can often be seen as inadequate. In London, for example, eligible residents can receive £2,000 for scrapping a car.[130] That's certainly enough to cover a small used car that is ULEZ compliant, but nowhere near enough to cover a larger family vehicle, let alone a new car. Auto Trader has also recently highlighted how used car prices remain at record levels (following supply chain disruption caused by Covid-19), with roughly 5,000 ULEZ-compliant cars below £5,000 available in London as of January – again, far smaller than the likely demand.[131]

Participants in our focus groups agreed that the inadequacy of funding was a real issue. As one Londoner put it, 'My daughter has to drive to work and is on minimum wage. So she can get £2,000 to scrap a car, but to get a ULEZ compliant car you need around £5,000 – so where's that difference coming from?'. Another commented, 'If you are really serious about making London green, you've got to offer more help and support to help people to change.'

The paltry level of funding available can also feed into the perception that CAZs are a form of stealth taxation. As one of the participants in our London focus groups commented, 'I doubt whether they're actually that bothered about emissions, I suspect it's a money raising scheme. If they were bothered about emissions they would provide a lot more money to people to help upgrade their vehicles.'

128 Mayor of London, '*92 per cent of vehicles comply with expanded ULEZ one month on*', December 2021. Link

129 Clean Air Greater Manchester, '*Greater Manchester Clean Air Zone statement*', January 2022. Link

130 Transport for London, '*ULEZ car and motorcycle scrappage scheme*'. Link

131 Auto Trader, '*London households face shortage of cheap car options to avoid ULEZ bills*', 20 February 2023. Link

Small businesses too can struggle with the added cost. In Greater Manchester's original scheme, cab drivers were meant to get up to £10,000, but the cost of a new model (such as the hybrid LEVC TX) can be £60,000 or more.[132] Supply also remains constrained for vans, driving up prices for CAZ-compliant used vehicles, although for larger vehicles sometimes retro-fitting can be option, lowering the overall cost.[133] In any case, for small firms these added costs can be a substantial burden.

> **'Giving residents sufficient time to adjust their personal routines and businesses is crucial if the popularity of these policies is to be maintained'**

Cost of living

As mentioned above, one of the main critiques of the London policy is the awful timing. The argument is that while a CAZ may be a good idea at some point in the future, forcing extra costs on to working people and small businesses already dealing with higher bills and inflation is a monumentally bad idea. It is important to be clear-eyed about the fact that someone will have to pay – vehicle upgrades are not cheap. But the aim of well-designed schemes should be to shift this burden to those who are most able to pay, rather than those who are struggling with their bills.

Timing

Another issue that often comes up is the amount of time for residents and businesses have to adjust to the new regime. One oft-repeated criticism of the ULEZ expansion is that it was announced in November 2022 and charges will apply from August 2023, leaving non-compliant drivers less than a year to upgrade their vehicles. The scrappage scheme was also not rolled out until late January, further tightening the timescale. In contrast, in Scotland the schemes were introduced with grace periods of one or two years, allowing for a far smoother transition.

Of course, any delay risks further contributing to the negative health impacts of dirty air. Yet giving residents sufficient time to adjust their personal routines and businesses is crucial if the popularity of these policies is to be maintained.

CAZs may not be the only answer

A final argument in opposition to CAZs relates to whether charging zones are the right policy measure to tackle the air pollution problem. Many opposition groups either argue that the problem can be solved with other measures such as speed restrictions, better public transportation or non-charging zones, or simply that the problem will solve itself over time given the natural replacement cycle of vehicles.

These are both fair points that are worth engaging with. On the first point, Coventry, for example, was able to negotiate with the Government to introduce a package of individual measures in lieu of a charging CAZ to bring air pollution within the statutory limits. It focused on improving NO_2 levels in specific spots where problems had been identified (on two roads), with investments in cycle lanes, road layout changes to allow traffic to flow more freely and traffic management measures to remove through traffic.[134]

132 Fleet News, *'£120m for fleet vehicle upgrades ahead of Manchester clean air zone'*, 2 July 2021. Link
For new hackney carriage prices see here

133 CarDealer, '*Used van prices hit record highs as Ulez extension beckons'*, 11 March 2023. Link
See retrofit schemes here

134 Coventry City Council, '*Coventry Local Air Quality Action Plan'* Link

This is clearly sensible and a significant advantage to local implementation of clean air action plans rather than a top-down national strategy. Local governments will often have a better idea of how to tackle the problem. If a scalpel will do the job rather than a sledgehammer, then local areas can rightly implement their own measures. On the other hand, such a strategy is clearly not suitable for larger cities, where the air pollution problem is widespread. Targeting only individual roads or intersections can simply shift the problem to other areas of the city, as drivers take circuitous routes to avoid the charges.

Similarly, the argument that non-charging zones are the answer should be treated with caution. While financial assistance for those who can't afford to pay is necessary in any case, it is doubtful that in the absence of a charging mechanism many people would choose to upgrade their vehicles. Even for those who are willing and able to upgrade, it is not a small expense.

> **'If a scalpel will do the job rather than a sledgehammer, then local areas can rightly implement their own measures'**

It is for this reason that the argument that the problem will simply solve itself over time does not hold much weight. True, given the replacement cycles of vehicles all the older cars and trucks would *eventually* get phased out. But this would occur over a period of decades, while dirty air would continue to have malign health impacts on the young and the elderly. Such a strategy may minimise disruption, but it does little to address the real environmental and health concerns that make people worry about unclean air.

How to build clean air zones that win over drivers

Comms, comms, comms

Although our polling suggests that voters are concerned about air quality and want the Government to do more on this issue, translating such sentiment into support for clean air zones requires effective communications. However, this has not always been an area of strength for CAZs – as the preceding section shows. How then to get this right?

First, explaining to the public why CAZs are being introduced and making crystal clear the link with clean air is critical. The comparison above of ULEZ posters is a perfect example of how to do this well and how to do this poorly. When the focus of communications is only on the implications of the policy rather than the need for the policy, one can see easily how concerned citizens can get upset.

Some cities have taken this messaging to heart and are worth highlighting as an example to others. Bradford has done particularly well – the council's campaigns around the CAZ were simple and effective, highlighting the air quality necessity and directing citizens to the policy website (see below).

Bradford Council public information campaign[135]

Source: Breathe Better Bradford

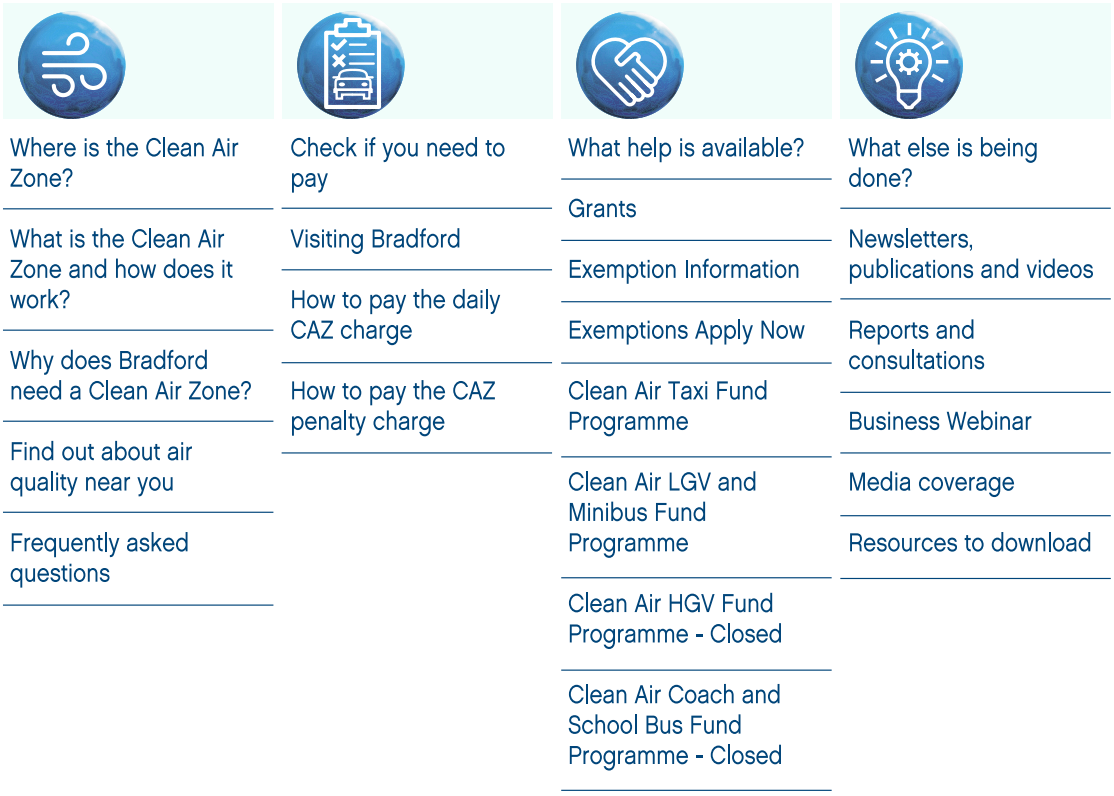
Head to the website and one is presented with a wealth of helpful information.[136] At the very top is a succinct summary of the policy – that the CAZ is now live, with a daily charge for certain vehicles (and the exclusion of passenger cars mentioned twice in bold font). It lists the exemptions available and how to pay. Scroll down and you find a whole suite of pages explaining everything there is to know about Bradford's CAZ: how it works, why it's needed, what help is available through various programmes, and what else is being done on air quality. Each of the click-through pages are presented in plain English with relatively few acronyms and are clearly designed to anticipate questions and pre-emptively answer them.

Bradford also scores well on another metric – the name of the scheme. *Breathe Better Bradford* is simple and effective, albeit a bit of a tongue-twister. Even better is Birmingham's *Brum Breathes* scheme – so simple the website even promotes the hashtag #brumbreathes. While the name of a scheme may seem trivial to a policy professional, to the average voter the name is literally the first impression of the scheme and gives a sense of its purpose. The use of the breathing metaphor in both scheme titles is smart – it keeps the focus on the raison d'être of clean air, and frames it in a way that the average person can understand (breathing better).

Contrast this with London's ULEZ – a meaningless acronym that becomes even more confusing once you spell it out. Does low emissions mean low carbon emissions or air pollution? ULEZ also sounds similar to LEZ (London's scheme for heavy diesel vehicles), so perhaps ULEZ is also only for heavy goods vehicles?

135 See here
136 Website here

Excerpt from Breathe Better Bradford



Source: Breathe Better Bradford

A final point worth highlighting is the communication of the charging mechanism, and why it is in place. Again, in a perfect world where everyone has upgraded their vehicles to Euro 4/6, no one will pay to enter the zone and the air will be much cleaner as a result. Yet this is how TfL describes charging (from the ULEZ landing page): 'If your vehicle doesn't meet the ULEZ emission standards and isn't exempt, you need to pay a £12.50 daily charge to drive inside the zone.'[137] There's no mention of upgrading or modal shift. The emphasis is purely on payment.

The 'Cars' subpage on the same site tells a similar story: after describing the vehicle standards, the next section of the page explains the charges. Although a bold-font sentence tells users 'We prefer that you use a vehicle that meets the emissions standards rather than pay a daily charge', the rest of the section details the charges and all the different ways one can pay (AutoPay, online, App store, by phone).[138] Only towards the bottom of the page (after discussing public transport) does it mention upgrading to a new vehicle that meets the standards and the scrappage scheme. No wonder there is such a strong perception among voters that ULEZ is either meant to raise revenue or force people out of their cars – because that's the impression the scheme's own website gives.

Local policymakers should therefore place much more emphasis in their public communication on the point that charging is sub-optimal and vehicle upgrades are the desired outcome, and that help is available to do so. After all, charging drivers of non-compliant vehicles £12.50 does precisely nothing to help combat air pollution, unless and until it drives behavioural change (or the money is used on other air pollution reduction measures, as discussed below). In our focus groups, some made

137 Transport for London, '*Ultra Low Emissions Zone*'. Link
138 Transport for London, '*Ultra Low Emissions Zone: Cars*'. Link

this point quite explicitly – as one Londoner put it, 'If you drive a dirty car it's still a dirty car even if you pay £13 per day'.

Vehicle upgrades and modal shifts should feature far more prominently, while charging should be described as a last resort. The impression should be that local authorities do *not* want you to pay.

Hypothecation

Of course, not all opposition to CAZs is down to bad communication and misunderstandings – there are obviously genuine policy disagreements as well. This section and the following one will discuss some of the lessons from the first generation of CAZ policies and consider how to design better schemes that bring citizens along rather than antagonise them.

> **'Our focus groups agreed strongly on this point – as one commented, 'It's a charge in transport. So, for me, it has to be put back in transport in some form'**

The first point to discuss is hypothecation – by definition, a charging clean air zone will raise revenue, so how should those funds be spent?

Currently, local authorities are statutorily bound to re-invest any excess revenue raised from the charges (over and above operating costs) into 'local transport policies' that aim to improve air quality.[139] This can take many forms – in London for example this is interpreted relatively widely, with TfL stating that 'all money received from the scheme is reinvested into improving London's transport network, such as expanding bus routes in outer London.'[140] Bradford on the other hand keeps the spending more tightly focused on air quality measures, including 'support for zero emission buses, further help for residents and businesses to upgrade their vehicles, the development of hydrogen in the district and support for schools to reduce emissions in their areas'.[141]

This kind of hypothecation makes sense from a political perspective, helping to dispel the notion that this is simply another mechanism to raise revenue, and ensuring that funds from non-compliant drivers are not used outside of transport. Our focus groups agreed strongly on this point – as one commented, 'It's a charge in transport. So, for me, it has to be put back in transport in some form.' Another participant voiced a similar sentiment – 'The charge is there to make London greener, so find a way to make London greener [with the revenue].'

While there is a line of argument to say that loosening the hypothecation requirement would encourage more councils to roll out clean air schemes, the statutory NO_2 limits require action on air pollution anyway. Moreover, there is a risk that by allowing local authorities to use clean air charges to directly raise revenue, public support for the scheme would fall as the 'stealth tax' narrative gains steam (quite understandably).

139 Department for Environment Food & Rural Affairs and Department for Transport, '*Policy paper: Clean air zone framework*', October 2022. Link. Paragraph 56

140 Transport for London, '*Why do we have a ULEZ?*'. Link

141 Breathe Better Bradford, '*What is the Clean Air Zone and how does it work?*'. Link

In the other direction, a more tightly hypothecated scheme could offer a promising way forward. Namely, if *all* revenue raised was recycled directly into scrappage schemes, this would both allow them to be more generous and ensure a clear link between those being charged and those receiving help. This sort of tight hypothecation would also do much to dispel the notion that CAZ schemes are designed to raise revenue.

> **'If all revenue raised was recycled directly into scrappage schemes, this would both allow them to be more generous and ensure a clear link between those being charged and those receiving help'**

According to our polling, the public seem broadly supportive of hypothecation. When asked what revenue raised from CAZs should be put towards (picking only one), the most common responses were helping people pay for vehicle upgrades (27%) and public transport upgrades (27%). Seventeen per cent wanted the funds returned as a council tax rebate, while only 11% thought the cash should go to the general council/government budget (with 17% responding don't know).[142]

This suggests that while there are differences of opinion regarding the best use of these funds, very few voters want CAZs to be a revenue-raising scheme in the traditional sense. Hypothecation towards specific clean air and transport-related aims, or a more generous scrappage scheme, thus appears to be a key plank in winning public support.

Scrappage schemes

There is also significant potential to improve the operation of scrappage schemes, beyond simply making them more generous by recycling more of the revenues from CAZs.

The first generation of scrappage schemes, like those in London, gave those on benefits block grants of £2,000 to scrap a car (admittedly in practice very few received this funding, as so little money was available).[143]

Our polling suggests that grants are popular and effective tools to drive vehicle upgrades – 74% of respondents indicated that a cash grant of £2,000 would make them more likely to change to a less polluting vehicle.[144] But while block grants have the benefit of simplicity and fungibility, they are relatively blunt instruments that leave residents to work out their future travel patterns for themselves.

More recent schemes have been more nuanced with their use of funding. In Birmingham, for example, residents can receive a £2,000 discount at an approved car dealership (with vehicle finance options available), which also arranges the scrappage of the old vehicle directly. But the funds can also be used to get £2,000 worth of travel credits with Transport for West Midlands, the equivalent of three years of free travel.[145] Edinburgh combines the two, offering £2,000 for disposing of an old vehicle and £1,000 Travel Better vouchers to buy bikes/e-bikes or public

142 BMG Research polling for CPS

143 Transport for London, '*Ultra Low Emission Zone: Scrappage Scheme*'. See archived page here

144 BMG Research polling for CPS

145 BrumBreathes, '*Vehicle Scrappage and Travel Scheme*'. Link

transport tickets.[146] Other local authorities have also set up dedicated schemes for other classes of vehicles such vans, minibuses, HGVs and taxis – for larger vehicles particularly, scrappage moneys can go towards retrofitting an existing vehicle to be compliant rather than purchasing an entirely new vehicle.

Giving residents flexibility in how they use the scrappage funds has proved to be an important selling point. Cars are individual by nature and what works for one resident or family may not work for another. A family of five may want a larger vehicle, or to be able to use the funds to lease a vehicle rather than purchase it outright. Indeed, the ability to spend your grant on a leased vehicle or a car share scheme had majority support in our polling (50% and 52% respectively), although both also had a sizeable proportion of 'don't knows' (23% and 25% respectively).[147] Similarly, shifting the daily commute to a bus or train may be relatively doable for some, and downright impossible for others. Flexibility is key here, as it allows residents to put the pot of funding available to the best use for them personally.

'Giving residents flexibility in how they use the scrappage funds has proved to be an important selling point'

Then there is the amount of funding available. This was a key point for our focus group participants, with many in London in particular feeling that £2,000 was not sufficient to upgrade their vehicle. While the generosity of any scrappage scheme will be limited by the amount of funding available, that is all the more reason for local authorities to hypothecate any net revenue raised for scrappage schemes rather than for wider uses.

Another aspect worth discussing is eligibility for scrappage schemes, and where the line should be drawn. In London, the scrappage scheme (both the original and the updated 2023 version) is only open to those on benefits (Universal Credit, plus others such as Personal Independence Payment and Pension Credit).[148] By contrast, in Birmingham all those earning under £30,000 per year (who live outside of the zone but work within it) are eligible for the scheme.[149] This is a significant difference. In London there will be a large number of individuals who are earning enough not to be on benefits, but for whom an outlay for a new car would still represent a significant financial burden.

146 The City of Edinburgh Council, '*Support and funding*'. Link
147 BMG Research polling for CPS
148 Transport for London, '*Ultra Low Emission Zone: Scrappage Scheme*'. Link
149 BrumBreathes, '*Vehicle Scrappage and Travel Scheme*'. Link

Chapter 4: The future of road pricing

Clean air zones are an important part of the future of motoring. But we also need to make much broader changes to the policy landscape. In particular, the time has finally come – as the Transport Select Committee has said – for Britain to embrace road pricing.

This will, we accept, represent a profound societal shift. Almost everyone uses some mode of transport daily, and members of the public will thus see the effect of any such policy change in their lives, day after day. It is therefore imperative that whatever changes are made, they are done in a way that brings the public along with policymakers.

> **'The time has finally come – as the Transport Select Committee has said – for Britain to embrace road pricing'**

Nor can this be a partisan issue. For changes of this sort to be durable and respected, cross-party consensus is essential. That is why we agree with the Select Committee's recommendation of an official review or commission to examine this issue in depth, and look to international examples. We would suggest such a body solicit input from members of the public, trade bodies and MPs.

We believe, however, that per mile charging *must* be the future of motoring taxation, initially for zero emissions vehicles, but potentially also for legacy petrol and diesel vehicles further down the line. This section will therefore discuss various options for bringing in a new system, as well as the associated practicalities.

This report also endorses the continued implementation of clean air zones throughout the UK, so long as we incorporate the vital lessons and provisos outlined in the previous chapter – and in particular learn from the errors made in London. However, we believe that clean air zones and congestion pricing are best left to local leaders, at least for the time being. While there is definitely scope for a national payments system and framework, integrating clean air zones and congestion pricing into a national scheme alongside per mile charging would likely make all three more difficult both to implement and to win support for.

Clean air and congestion are fundamentally local issues (primarily concentrated in big cities) and the policy solutions should be tied as tightly to the policy problems as possible – the principle behind devolving power down. Indeed, in our polling, 60% of respondents thought that local governments should be mainly responsible for reducing traffic congestion in their local area, relative to only 26% who thought it should be up to the national government.[150] Not to mention that, as Tony Blair discovered, implementing per mile charging will take up enough political capital without layering on national clean air standards and congestion pricing.

150 BMG Research polling for CPS

Bringing the lessons of clean air zones into per mile charging and congestion pricing

The most obvious initial point to make is that proponents of both per mile charging and congestion pricing need to learn from the implementation of clean air zones. This is the area of road user charging where by far the most progress has been made in the last few years, and where the most recent data points lie. Many of the themes we discussed in the previous chapter have significant read-across for other areas of road user charging.

Clear and simple communications

One of the most important lessons is effective communication. As discussed above, a consistent theme of opposition to CAZs across the country is a lack of information about the policy, and the perennial suspicion that they are really intended to raise revenue rather than clean up the air.

> **'For per mile charging, the focus of public campaigns should be on replacing fuel duty and VED with a fairer, more transparent system, not the minutiae of the charges themselves'**

Any communications with the public need to be clear, simple and to the point – acronyms and policy jargon should be avoided at all costs. Though it may seem trivial, the scheme's name is an important place to start (e.g. *Breathe Better Bradford* not *ULEZ*). For example, Campaign for Better Transport has referred to per mile charging as 'pay-as-you-drive'.

Similarly, the policy goal (e.g. clean air) must be front and centre of any communications, rather than the mechanism (e.g. charging). For congestion charging, the centrepiece should be traffic itself and the public's hatred of it, not the time-based charges. For per mile charging, the focus of public campaigns should be on replacing fuel duty and VED with a fairer, more transparent system, not the minutiae of the charges themselves.

This is not to downplay the importance of the details – indeed, much confusion over CAZs stemmed from a lack of understanding of which vehicles would be charged. Fortunately, neither congestion nor per mile schemes have this precise problem (charges generally apply to all drivers). But there are still complexities to contend with.

Road pricing schemes as regressive

Moving to the design of the policies themselves, one critique often levied at CAZs is the regressive nature of the fee. £12.50 per day for non-compliance affects poorer drivers more acutely than wealthier ones. Similar accusations could well be levied at per mile charging – although of course fuel duty and VED today do not differentiate based on income, and indeed are often critiqued on this basis.

For CAZs, the answer to these critiques is scrappage schemes that are targeted at those on lower incomes (and small businesses that cannot afford to pay). There is substantial read-across here to any future per mile charging scheme. If the flat nature of fuel duty is replicated, then the new regime will face the same criticisms as the old, namely that the rich pay the same rate as the poor.

It is worth stressing that not every feature of our tax system must be progressive. A Toyota Prius causes the same amount of damage to the road – and takes up the same amount of road space – whether its driver is rich or poor. Given that the current system is flat, there is a principled argument to be made that its replacement should maintain this structure.

Nonetheless, the experiences of CAZs show that there will likely be a strong clamour to make any new system progressive, particularly given that it will be much easier to do so than with fuel duty levied at the pump. Indeed, calls for a progressive system will likely grow louder given the tax will become more visible than it is today, in the same way that a daily £12.50 charge energises opposition.

> **'Calls for a progressive system will likely grow louder given the tax will become more visible than it is today, in the same way that a daily £12.50 charge energises opposition'**

There is not only fairness to consider in terms of income, but fairness in terms of geography. Why should drivers in the Highlands, where distances are vast and public transport is spotty to non-existent, pay the same as those in London, for whom bus and Tube services are plentiful? Hence the proposals below for free mileage allowances, varying depending on income level or geography.

There would, of course, be a trade-off between social objectives and economic efficiency in any system of allowances. Moreover, the experience of CAZs shows that while 'mitigations' of this kind can effectively head off criticism, they can also be contentious – sometimes becoming some of the most controversial elements of any road charging scheme. Politicians should prepare accordingly and proceed with caution. It is important to get this right – too few concessions to public sentiment and reform will be hard to get off the ground; too many, and you end up with complexity and muddled incentives. And once granted, concessions can be hard to take away.

On congestion charging, it is easy to see how the same critiques could apply. While the charges do need to apply to all vehicles in order to create the intended behavioural effect, if the level of the charge is the same for everyone this could place a burden on poorer members of society – £15 to drive into London in the daytime is a lot more affordable for some people than for others.

However, creating a means-tested congestion charge would present significant practical difficulties. London's congestion charge has specific discounts and reimbursements for individual groups such as Blue Badge holders and NHS staff, but otherwise does not differentiate on income.[151] Cambridge has proposed offering tapered discounts for people on low incomes, administered via an application process.[152] Should it go ahead, this would be an interesting solution to bringing means-testing into congestion pricing schemes, helping to head off common critiques of both these and CAZs around affordability. Time will tell whether the example is worth other cities emulating.

151 Transport for London, '*Congestion Charge: Discounts and exemptions*', 2023. Link

152 Greater Cambridge Partnership, '*GCP Making Connections 2022*', Autumn 2022. Link

Hypothecation

Another key point from CAZs is the importance of hypothecation. Currently, local authorities are required to reinvest any excess funds from such schemes into local transport policies, and we set out the argument to go even further by, for example, allocating this money solely to scrappage schemes. This is an important tool in blunting criticism that these zones are designed to be revenue-raisers. Indeed, our polling and focus groups show that such hypothecation is very popular with voters.

> **'While the Treasury has historically resisted hypothecation, leveraging it for per mile and congestion charging could be a key plank in winning political support for the schemes'**

While the Treasury has historically resisted hypothecation, leveraging it for per mile and congestion charging could be a key plank in winning political support for the schemes. To the former, the Government could give assurances that unlike the current system of fuel duties, revenues from the new system really would help improve the roads and public transport, in the same way that the revenue from CAZs goes to improving air quality and local transport. Indeed, one of the main critiques of the current system in our focus groups was a (justified) lack of confidence that the money raised from taxing motorists was actually spent on motoring, leading to significant frustration among participants. Similar promises could be made with regards the revenue raised from congestion charging – for example, through improved bus services.

Per mile charging

So taking all of these lessons together, what does this suggest for the future of road pricing?

While many variations have been proposed, pretty much all of them involve taxing vehicles a set rate for every mile driven, collected monthly in arrears.

In many ways this is similar to the current system of fuel duty, which in effect taxes drivers per mile, in that fuel duty is assessed on every litre of fuel, and hence driving more requires paying more fuel duty. The principal difference of a per mile system is that the charges are made explicit (rather than buried in the cost of fuel), and that the taxation regime can be made 'smarter' in various ways, discussed further below.

Another crucial advantage of a per mile system is that it is an opportunity to rebalance the current burden of taxation away from motorists. After all, the Treasury currently uses fuel duty as a cash cow, collecting far more than is invested in the roads – meaning that rural motorists are in effect subsidising non-driving urbanites every time they fill up at the pump. This is manifestly unfair, and a new system of per mile charging will allow the (much reduced) revenues raised from motoring to be actually invested back into the roads.

However, before moving to our recommendations, it is worth pausing to discuss why per mile charging is the right approach, rather than just making up the entire shortfall as fuel duty withers away via general taxation. After all, putting up income tax would likely be a simpler way of recouping this lost revenue than creating an entirely new system of vehicle taxation. However, such an approach would not be in keeping

with the 'user pays' principle, namely that upkeep of the roads should be funded primarily by those who use the roads, rather than the general population. Placing a levy on road use also helps to avoid the 'tragedy of the commons', by which public resources become overutilized if there are no constraints on their consumption.

So there is a principled case for introducing road pricing as a replacement for VED and fuel duty – and it is one that we support. But how to approach it?

A new per mile charging system for zero emissions vehicles

We suggest that the principal focus of per mile charging should be electric vehicles (and other zero emission vehicle types such as hydrogen fuel cells). This will keep the policy solution tightly tied to the fiscal problem, while leaving the current system of fuel duty in place for the time being for legacy petrol and diesel vehicles.

> **'Petrol and diesel drivers rightly pointed out that it was unfair that EV drivers today contributed nothing to the upkeep of the roads, despite causing significant damage given their weight'**

In our focus groups, EV drivers instinctively understood that the current tax-free status of their driving could not continue indefinitely. Petrol and diesel drivers rightly pointed out that it was unfair that EV drivers today contributed nothing to the upkeep of the roads, despite causing significant damage given their weight. Thus, while no one likes to have their taxes put up, there was a begrudging consensus that the current system would have to adapt to the new future of ZEVs, and that those currently driving an electric car would have to stump up down the road.

It is worth pointing out that the UK would not be the first to bring in such a charge – the Australian state of Victoria has already introduced such a system, charging EVs and hydrogen vehicles 2.6 cents/km and plug-in hybrids 2.1 cents.[153] Users submit readings of their milometer directly to the government (i.e. sending a photograph), which then calculates the relevant charge.[154] Western Australia has announced a similar policy, although it is holding off implementing it until 2027.[155] The American state of Utah has introduced a similar programme for EV and hybrid drivers on an opt-in basis – users can choose either to pay a flat fee, or pay for the number of miles they drive (at a rate of 1 cent/mile), up to the amount of the flat fee.[156] Recording the mileage is accomplished either via embedded telematics or an in-car device (provided by a third party), as well as a phone app, and users are given monthly statements, charged to a credit or debit card.[157]

Of course, the desire to make up the looming revenue shortfall must be balanced against the delicate issue of not denting the take-up of EVs. In the current moment, the Government is desperately trying to convince motorists to make their next vehicle a ZEV, and the lack of a fuel duty equivalent is undoubtedly a powerful means of persuasion.

153 State Government of Victoria, '*ZLEV road-user charge*'. Link

154 Ibid.

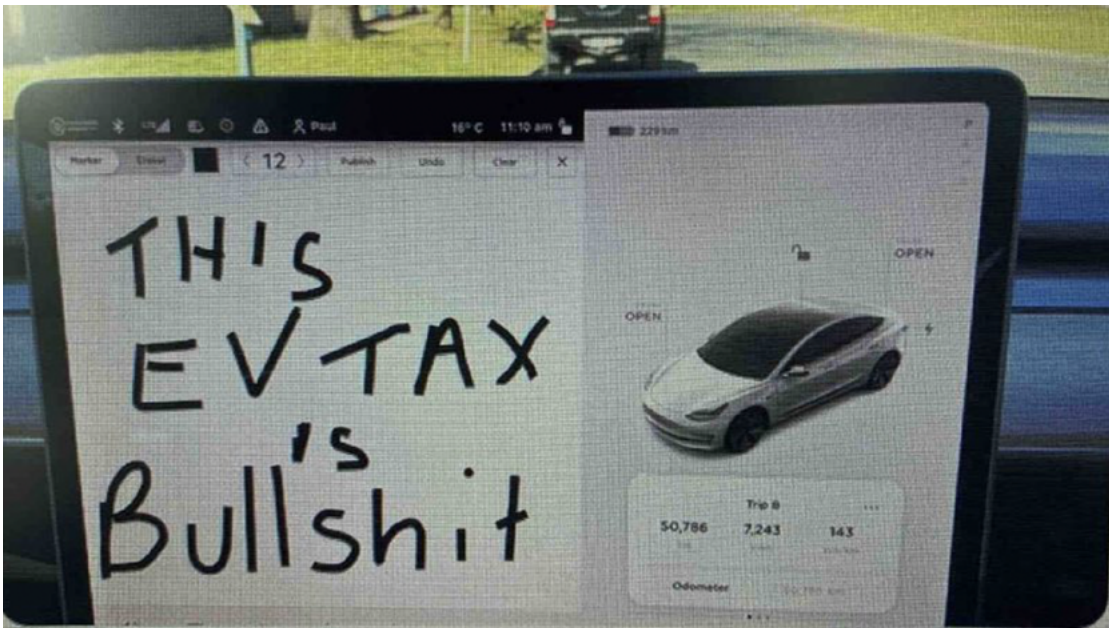
155 Government of Western Australia, '*WA's climate action efforts accelerate with $60 million EV package*', 10 May 2022. Link

156 Utah Department of Transport, '*Welcome to Utah's Road Usage Chage Program*'. Link

157 Utah Department of Transport, '*Road Usage Charge: FAQs*'. Link

Victoria's experience shows the potential pitfalls of introducing a per mile charge for ZEVs too quickly. The state is relatively unique in bringing in such a policy on a mandatory basis (rather than opt-in) and also immediately, rather than later in the decade. It has thus been branded the 'worst EV policy in the world' by the industry, on the grounds that it will dent take-up of EVs.[158] The opposition Liberal party branded the policy 'bat-shit crazy' and promised to drop the tax if elected.[159] Nor do EV drivers themselves seem to like the new tax, as the below picture shows.

How one Victoria EV owner filed his milometer reading[160]



Source: The Driven

In order to avoid this sort of backlash, the Government should not introduce per mile charging immediately in the UK. Sufficient time will be needed to design the system and gain political consensus, and EV drivers need to be given enough advance warning to avoid having the rug pulled out from under them.

The Government could declare that the new system will apply to all ZEVs from a certain year, likely towards the end of this decade. Ideally, the charges would start at quite a low level, and gradually rise to their steady state over time, to allow everyone to adjust. However, the Government cannot afford to leave this transition too long – the carbon budgets assume that ZEVs will make up 25% of the total car fleet by 2030, and 52% by 2035 (and by 2030 of course new petrol and diesel cars will be banned).[161]

What about petrol and diesel vehicles?

The Government should likely keep fuel duty (and vehicle excise duty) in place for legacy petrol and diesel vehicles, at least for the foreseeable future. After all, the current taxes are familiar to motorists, easy and cheap for the Government to collect, and can continue to function in parallel to the new system as ZEV take up increases.

158 The Driven, '*Victoria's road tax plan dubbed 'worst EV policy in the world''*, 22 April 2021. Link
159 The Driven, '*Victoria Liberals promise to drop 'bat-shit crazy' EV road tax, if elected*', 19 April 2022. Link
160 The Driven, '*Victoria's controversial EV road user tax to increase from July 1*', 30 June 2022. Link
161 HM Government, '*Carbon Budget Delivery* Plan', March 2023. Link. Appendix C, Table 7 (page 171)

However, another option (advocated by some) is to move everyone over to a per mile system in one 'big bang' moment, replacing fuel duty and vehicle excise duty entirely. New Zealand provides an example of such a system, albeit on a small scale. Diesel vehicles in the country are not taxed at the source as petrol drivers are – rather they must pay through road user charges.[162] While this system targets larger vehicles over 3.5 tonnes, diesel cars and vans are included as well. Users are obligated to pre-purchase distance licenses in 1,000km units, with rates varying based on vehicle type (diesel cars pay NZ$49 per 1,000km for example).

> **'For both political and practical reasons, it is likely easier to keep the focus of per mile charging on ZEVs, while letting fuel duty run down naturally'**

However, such an approach would have several drawbacks. Firstly, extending per mile charging to petrol and diesel vehicles is not strictly necessary (in that such motorists can easily continue to pay fuel duty as they do now), and hence risks being perceived by voters as government over-reaching and taking a sledgehammer to a problem that may only require a scalpel. Secondly, even if drivers were guaranteed not to pay more in per mile charges than they do under the current system, the public may perceive it as a 'new' tax. In our focus groups, petrol and diesel drivers were indeed wary of a new system (for their existing vehicles), suspecting that the Government would use it as an excuse to put up tax, or that it would go on top of fuel duty, not replace it. After all, one of the administrative strengths of fuel duty is that it is buried in the per litre cost at the pump, and few motorists can directly quantify its impact. Any adverse media coverage of the scheme (as happened famously in 2007) could only further put off voters. Thus, there is the risk that by trying to do too much at once the entire project of reforming motoring taxation could be scuppered.

For both political and practical reasons, therefore, it is likely easier to keep the focus of per mile charging on ZEVs, while letting fuel duty run down naturally, at least for the next decade or so. While this would carry with it the downside of running two vehicle taxation systems simultaneously (with the inherent complexities that could create), it is likely the lesser of two evils.

Further into the future, however, the remaining legacy petrol and diesel vehicles could be brought into the scheme if desirable, for example on an opt-in basis. A model for such a system is the US state of Oregon, which has been running a small-scale pilot programme since 2015.[163] Volunteer participants pay 1.9 cents per mile, tracked via plug-in devices, GPS or manual entry, and can choose between pay as you go and post-paying quarterly. Drivers of fuel-powered vehicles then receive a credit for the fuel tax they pay (38 cents per gallon), up to a zero balance. However, whether or not to bring legacy vehicles into the per mile system is a decision for 10-15 years from now, and thus difficult to pass judgement on at this point.

How per mile charging would work

Having discussed which vehicles the new 'pay as you drive' scheme would apply to, the subsequent sections will delve into the practicalities of implementing per mile charging.

162 Waka Kohtahi: NZ Transport Agency, '*Road user charges (RUC).* Link

163 Oregon Department of Transportation, 'OReGO', Link Link

At its most basic level, every driver would be taxed at a set pence per mile rate. At the end of the month, you would simply multiply the miles driven (less any free allocation, as discussed below) by the fixed rate to give the total charge. Rather than having two separate taxes as at present for petrol and diesel drivers (VED and fuel duty), drivers would have only one to deal with. Charges could be collected monthly (or at longer intervals) via direct debit. We believe the per mile rate should vary based on the weight of the vehicle (as heavier vehicles cause more damage to the roads). This of course reflects the current system, under which heavier cars consume more fuel and hence pay more fuel duty.

A central element of the 'promise' of a per mile charge should be that EV drivers will pay significantly less in tax than their petrol and diesel counterparts. This will be in keeping with the spirit of carbon taxation, providing an economic nudge to switch to lower emission modes of transport. While it will not be quite as powerful an incentive for take-up as the complete lack of per mile taxation on EVs today, it will still give current petrol and diesel drivers a financial reason to make their next vehicle purchase a ZEV.

'A central element of the 'promise' of a per mile charge should be that EV drivers will pay significantly less in tax than their petrol and diesel counterparts'

In order to ensure that these incentives function as they are intended to (e.g. when drivers are choosing which car to buy) it is crucial that the per mile charge is known in advance. Indeed, this transparency is one of the great potential benefits of per mile charging: if every car came with a clear per mile rate, it would be extremely easy for drivers to instantly compare the running costs of different vehicles – while also nudging buyers towards cars with lower impacts on the roads.

It is important to be clear that this system, as we envisage it, would not be 'smart' – where and on what road users drove and at what time of day they chose to do so would not be recorded or taken into account. Only the raw miles driven would matter. So this system would not 'replace' or 'duplicate' other road charges such as toll roads or congestion charges – but would also do more to respect drivers' privacy than smarter systems.

Free mileage allocations

One main criticism of this policy is that it is unfair to those living in the countryside, who have to drive longer distances and have less access to public transport. Of course, precisely the same criticism could be levelled at fuel duty. But there is an opportunity with the transition to address this via the concept of a free mileage allocation. As the name suggests, a certain number of miles every year should be 'free', with the per mile charge only kicking in after the allocation expires.

From a presentational perspective, a free mileage allowance would help to dispel the notion that this charging scheme is inherently anti-car (voters generally enjoy being given things for free). Secondly, a free allocation sets a gentle psychological nudge to reduce car usage, by introducing the concept that voters are 'paying' for their usage of the roads over and above a given allowance.

We suggest that mileage allowances should be based on geography, most likely being linked to the postcode at which the vehicle is registered (or potentially at which council tax is paid, if policy-makers are nervous about second-home owners registering their Chelsea tractor at their holiday home). In simple terms, each postcode could be given a score based on 'remoteness' and the availability of public transport. The more car-reliant you were, the greater your free mileage allowance would be.[164]

> **'Our focus group participants instinctively felt that rural drivers who are forced to rely on their cars should not be taxed as heavily as those who have access to other options'**

There is an element of fairness at play here – the number one reason cited by voters to oppose per mile charging (on a uniform basis) was that it would be unfair on those who have no alternative but to drive.[165] As James Court, head of EVA England (an EV drivers' lobbying group) told the Telegraph: 'I have a sister who lives in Devon. Should she be charged the same price per mile that I do living within the M25, when I've got a plethora of transport options, and she has none?'[166] Our focus groups agreed – fairness was a key issue in participants' minds, and the proposal to use geography as a key differentiating factor enjoyed widespread support. Participants instinctively felt that rural drivers who are forced to rely on their cars should not be taxed as heavily as those who have access to other options.

What's more, the suggestion to use geography as the primary differentiating factor when introducing road user charges has been argued for extensively. Glaister and Graham famously showed how under a more efficient system of road pricing (including factors such as congestion and environmental damage), urban drivers would pay significantly more, while rural users would generally pay less than they do today.[167] While such a system is more advanced than the one we are proposing, the outcome could potentially be similar. That is, urban drivers – who tend to have far more public transportation options – would receive a lower allocation of free miles, while rural drivers could receive a higher allocation. This nudge for urban users to reduce their car usage would also have benefits for congestion and clean air.

While such a system would explicitly favour rural drivers, this is unlikely to create a large enough incentive to empty the cities – after all taxation is only a portion of total fuel costs, and taking a step back, the cost of motoring is only one among myriad factors that contribute to economic geography.

From a practical perspective, free mileage allowances should apply to cars rather than people (to avoid issues with multiple drivers of the same car). However, where households have more than one car, only one allowance per adult should be allowed (otherwise rich individuals could simply buy more cars for more free allowances).

164 A fruitful avenue for further research would be quantifying the UK's postcodes based on these metrics, and on this basis estimating the actual values for free mileage allowances (assuming revenue neutrality).

165 Campaign for Better Transport, *'Pay-as-you-drive: The British public's views on vehicle taxation reform'*, September 2022. Link, Page 24

166 The Telegraph, '*Why running electric cars could soon get a lot more expensive'*, 11 December 2022. Link

167 Glaister, S., & Graham, D. J. (2006). Proper Pricing for Transport Infrastructure and the Case of Urban Road Congestion, Urban Studies, 43(8), pp.1395–1418.

Deciding exactly where to set the free allocation may be difficult – put it too low and voters will perceive it as a gimmick, too high and no revenue will be raised. According to MOT data, average mileage driven as of 2021 was c. 5,300 miles, down from c. 7,400 miles in 2019 (Covid may of course play a role here).[168]

Ideally the 'basic' allowance should be set at a relatively low level – enough to be meaningful but not so high that drivers perceive they can use the roads ad infinitum without paying. Of course, as the per mile rates are reviewed, so too should the free mileage allocation, depending on road usage and transport goals. But the key point here is that fuel duty is currently just as unfair as any new system would be, if not more so.

Concessions

Fuel duty is often criticised on the basis that it is unfair on lower earners, because they pay the same rate of tax on fuel as higher earners (by default, given that tax is applied at the forecourt regardless of who is filling up).

Inevitably, some people will argue for a change of approach as we transition to a new system of per mile user charging. Indeed, in the Campaign for Better Transport survey, respondents thought that concessions for specific groups would increase their support for the new system as a whole – so there is a clear *political* case for some concessions to be built into the reform, provided doing so doesn't undermine the economics of the whole thing.[169] Similarly our focus groups were quick to point out other groups that (to their minds) deserved concessions, such as those with disabilities, on lower incomes or who have to drive for work.

The simplest way to do this would be via the same system of free allowances that we outlined above. In certain limited cases, drivers could be given additional free mileage allowances based on their economic circumstances. Such allowances would both reduce the tax burden they faced and introduce a degree of progressivity into road user charging – which some might see as an advantage.

'The difficulty with concessions is deciding who exactly will be eligible'

However, the difficulty with concessions is deciding who exactly will be eligible. How should you treat middle-income households in transit-free rural areas relative to poorer people in cities with good public transport? Should key workers be included in any concession? If so, is that only NHS workers, or also teachers and cleaners and so on? Do you judge by individual income, or by household?

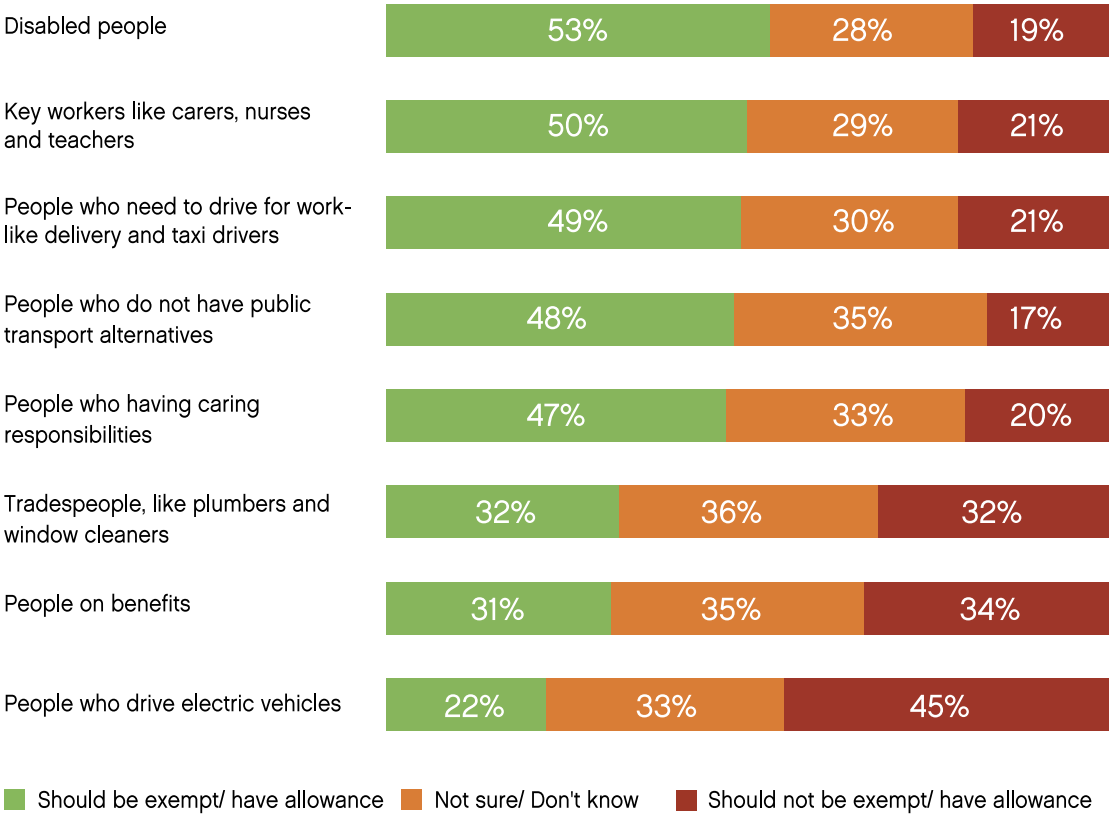
Our focus groups saw this issue clearly – as one participant put it, 'This would help make it fairer, but I always feel like there's grey areas with this – who decides?'. Another commented that while they liked the proposal in theory, in practice it would be 'massively open to a lot of problems and complexity, I don't think they'll ever get it really fair'.

168 Department for Transport, '*Statistical Data set NTS 0901: Annual mileage of cars by ownership and trip purpose, England: 2002 onwards*', August 2022. Link

169 Campaign for Better Transport, '*Pay-as-you-drive: The British public's views on vehicle taxation reform*', September 2022. Link Figure 10 (page 25)

Beyond the difficulties of drawing the line fairly, voters seem split on the broader question of who exactly is 'deserving' of concessions. In the polling conducted by Campaign for Better Transport, respondents were asked which groups should have free mileage allowances.[170] Disabled people were at the top of the list, but so too were key workers and delivery and taxi drivers. Interestingly, more concessions for those without public transport alternatives had strong net support, but not so for those on benefits. Perhaps unsurprisingly, for each group nearly a third of those surveyed responded with not sure/don't know. It was also striking that there was extremely limited support for exempting drivers of electric vehicles as a class.

Should any of the following groups be exempt from pay-as-you-drive, or have a free mileage allowance?[171]



Source: Campaign for Better Transport

Finally, and perhaps most importantly, if concessions were made too widely available, they would undermine the economic efficiency of per mile charging. Pragmatic policy reformers will likely tolerate some free riding (that is, driving without facing the relevant fees) for the sake of a politically workable scheme. But ultimately, a given car will have the same impact on the roads, on congestion, and on the environment whether it is driven by a prince or a pauper.

How would per mile charges be paid?

Another aspect of the scheme worth discussing is how payments would be collected, and the potential for evasion. A direct debit at monthly (or potentially longer) intervals is likely the best option for the majority of people, allowing for efficient collection without having to remember to pay. However, this may not work

170 Campaign for Better Transport, *'Pay-as-you-drive: The British public's views on vehicle taxation reform'*, September 2022. Link Figure 11, page 26

171 Ibid.

for everyone – indeed, a major concern that many focus group participants raised was the potential for evasion, either unintentionally or with intent. Taking the former first, many expressed the view that because the amount of miles they drive could vary significantly from month to month, budgeting for paying per mile charges could be difficult. Furthermore, because the system would generally operate on a post-pay basis, lower income individuals in particular could find themselves racking up large charges in a heavy-mileage month and thus face financial difficulties. By contrast, given fuel duty is levied at the pump (essentially a pre-payment mechanism), by definition individuals can only afford as much tax as they can fuel.

> **'The experience of VED would suggest that revenue leakage may not be a significant issue'**

These are important points to consider. Allowing for pre-payment (in the manner of energy prepayment meters) would seem an obvious way to help with budgeting for lower income individuals. So too would establishing a monthly average based on usage history and using this as the basis for the direct debit (for those post-paying), leaving the settling of small debits and credits to be carried out subsequently. Smart analytics based on past usage (and wider trends) could also be a helpful tool in budgeting.

Turning to deliberate evasion, given that fuel duty is almost impossible to avoid, any per mile system will unfortunately tend to be more open to evasion and hence revenue leakage. In practice this will depend heavily on which technology option is used, discussed further below. However, it is instructive to compare this to vehicle excise duty, which similarly relies on citizens paying via direct debit (or credit card). While DVLA does have enforcement teams (and untaxed vehicles can be clamped or impounded), evasion rates are relatively low – 1.9% as of 2021, according to the latest government estimates.[172] A system of per mile charging should have similar penalties for non-payment, but the experience of VED would suggest that revenue leakage may not be a significant issue.

Revenue and spending considerations

Having discussed the basic workings of the proposed per mile charging scheme, the natural next questions have to do with revenue – both how much is to be raised, and how that revenue should be spent.

Taking the former first, one of the key advantages of a new per mile charging system is that the Government can use this as an opportunity to rebalance the burden of taxation, giving relief to the long-suffering motorist. As discussed in Chapter 1, the current system of fuel duty is manifestly unfair, with motorists paying substantially more in tax than is ever re-invested into the roads, with the rest going to the general government budget (for schools, the NHS and so on). Put another way, non-drivers are being subsidised by those who drive, to the tune of billions of pounds per year.

Thus, simply because it was (historically) seen as politically easier to raise fuel duty than other forms of taxation, the current system is essentially a very heavy and

172 Driver and Vehicle Licensing Agency, '*Tax it, don't risk it – DVLA hits the road to highlight the risks of vehicle tax evasion*', March 2022. Link
Department for Transport and Driver and Vehicle Licensing Agency, *'VED0101: Rate of unlicensed vehicles in traffic, by tax class: Great Britain'* November 2021. Link

specific consumption tax on one particular activity (driving). Whereas ideally spending that is unrelated to motoring should be raised via a broad-based consumption tax such as VAT, spreading the burden widely across society and thus creating a more efficient tax system. Of course beyond purely fiscal considerations, driving does create externalities such as GHG emissions and air pollution, and the 'polluter pays' principle would demand a commensurate level of taxation. While for petrol and diesel cars these are indeed substantial, for EVs such externalities will be significantly lower, bolstering the case for lowering the burden of taxation on ZEV drivers. Finally, lowering the (national) tax take from drivers need not lead to increased congestion, as local charging schemes can and should be brought in to target this issue far more directly.

'One of the key advantages of a new per mile charging system is that the Government can use this as an opportunity to rebalance the burden of taxation, giving relief to the long-suffering motorist'

The advent of a new per mile charging system is the perfect opportunity to redress this imbalance, particularly since the changes will happen gradually as EV take-up increases. One possibility, of course, is that since per mile charges will raise less than fuel duty otherwise would, the Government will use this transition as an opportunity to trim spending and reduce the (currently eye-wateringly high) tax take. However, given the recent march towards an ever-larger state, this seems sadly unlikely. In this case, taxation will need to rise elsewhere to compensate. While it is not within the scope of this report to lay out the appropriate taxation changes in precise detail, they should be broad-based, ideally focused on consumption, and not disproportionately targeted at any particular group like the current system is.

Turning to the spending side of the equation, the Government should take up the mantle of hypothecation. In our focus groups, one of the biggest frustrations of drivers was the fact that fuel duty is in no way tied to spending on the roads. One commented, 'If I knew where the money for fuel duty was going I would feel much better, but I don't have any transparency about where it goes – it's not going back into the roads.' This undermines support for the system as a whole, as motorists rightly feel they are getting a raw deal (particularly given the state of the roads in this country).

A key way to win support for the new system could be explicitly hypothecating the revenue raised from per mile charging. This point was made repeatedly in our focus groups, with several participants mentioning that if they were convinced the money was being re-invested in the roads, they would be keener on the system as a whole. The Government should thus make this commitment publicly, and if possible create an annual spending summary with a more detailed breakdown of what the funds have been used for (if possible tailored to drivers' local areas) to reinforce this message.

One potential model for such a system comes from the public utilities. Before privatisation, railways and water companies were in a similar position to National Highways today, allowed to levy user charges but not able to set their own budgets, as the Treasury was the ultimate arbiter of funding. The privatisation process carved these out of government and created independent bodies that regulated utilities' business models, ensuring linkage between user charges and utility budgets (as well as giving firms the ability to raise money to pay for infrastructure improvements, guaranteed by future bills). This model could be replicated for a future road pricing system, with the level of per mile charges (and other charges such as tolls) set by an independent body that would ensure fairness and value for citizens.

Hypothecation could also make funding road improvements easier. If citizens knew that the funds were being spent on specific projects (and thus could see their tax money at work), they might be more willing to accept rises in the per mile rates. Setting per mile rates might no longer be a political football in the way that fuel duty is today.

> **'A key way to win support for the new system could be explicitly hypothecating the revenue raised from per mile charging'**

Finally, some will inevitably argue for widening the definition of the hypothecation beyond road spending, to for example EV infrastructure or transport more broadly (such as buses and trains). While this sort of flexibility has an obvious appeal to the Treasury, future governments should tread lightly. The political benefits of hypothecation will likely only be felt if revenue and spending are tightly tied together, and drivers can visibly see their tax revenue at work. Thus, while using per mile charging revenues to fund a new local bus service could be viable, supporting train track improvements hundreds of miles away would be less sensible. A looser form of hypothecation would also break the explicit link between revenue raising and spending on the roads, potentially undermining support for the scheme. Motorists may rightly ask why they are funding public transport infrastructure that they may never use.

Technology options

Next, it is worth discussing exactly how per mile rates will be assessed for individual drivers – or, in other words, what technology will be used. There are a wide variety of options, ranging from the very simple (milometer readings) to the advanced (in-car devices with GPS capabilities). The latter is certainly the most sophisticated and flexible option – but privacy and vehicle tracking have historically been a key concern regarding road pricing schemes. Government will need to balance the competing demands of minimising the potential for evasion (and revenue leakage) with a reasonable expectation of privacy. Cost and ease of use for motorists are also important considerations.

Starting with the lowest-technology end of the spectrum, milometer readings could be submitted on a periodic basis as in the Australian state of Victoria, with the user-inputted data cross-checked against a vehicle's annual MOT. In this version, paying road tax would be like paying energy bills, with which most citizens are very familiar. Although the process of submitting readings could be somewhat tedious, there would be no need for additional technology and hence the monetary cost to the motorist would be nil. There would certainly be a higher potential for evasion than currently exists with fuel duty, but an MOT cross-check should provide a deterrent and catch out fraudsters.

A slightly more advanced version of this system would be an in-car device installed solely for the purpose of tracking mileage, obviating the need for users to submit milometer readings manually. While such a device could be made mandatory, more likely it would be a voluntary upgrade, similar to users choosing to install smart meters in their home to automatically monitor their energy usage. The cost of such devices would likely be low as they would not need to be 'smart' in any way.

A variation on this idea is to use insurance 'black boxes', which many insurance firms already offer incentives to install. Wolfson Prize winner Gergely Raccuja pointed out that insurance firms already have much of the relevant data via these telematic devices, and from a user perspective the experience would be seamless.[173]

173 Raccuja, Gergely, '*Miles Better: A distance-based charge to replace Fuel Duty and VED, collected by insurers*', Wolfson Economics Prize and Policy Exchange, 2017. Link

One final (and still relatively low-tech) system would be a network of roadside ANPR cameras, as many clean air zones in the UK use today. Vehicles would only be tracked via their number plates, and individual citizens would not need to submit any data on their own, nor require any new type of technology. However, while these may work well for clean air zones with defined boundaries, the practicalities of implementing such a system UK-wide are daunting. In order to be effective at tracking every mile driven, cameras would need to go up on every road in the UK, at enormous cost to the taxpayer, with very little benefit over less costly options that would accomplish the same goal.

'We tested all of these options with our focus groups, and perhaps unsurprisingly found a variety of opinions'

At the higher-tech end of the spectrum, many new cars today already have GPS systems built in. Although obtaining the data from vehicle manufacturers could pose a challenge, drivers of GPS-enabled vehicles would enjoy a seamless experience. For those that don't have GPS built-in, tracking devices with GPS capabilities can be obtained for £20, plugging into the vehicle's cigarette lighter socket.[174] Finally there is of course the option of a smartphone app – of the kind that already exist to help users track their mileage for tax purposes.[175]

We tested all of these options with our focus groups, and perhaps unsurprisingly found a variety of opinions. The basic option of submitting milometer readings was relatively popular – while participants acknowledged the extra effort involved, they liked having control over the readings that were submitted (to ensure accuracy), and seemed somewhat suspicious that more advanced systems would work reliably. For those concerned about privacy and location tracking (not everyone, but a substantial number), this option was especially appealing. The middle option of an in-car device analogous to an energy smart meter was the most popular – participants felt that avoiding having to submit readings would be more convenient and require less administrative hassle. On the other hand, high-tech options requiring GPS tracking faced significant resistance, with concerns around privacy and complexity front of mind for many participants. However, the few who opted for it argued it would reduce administrative hassle yet further, and of course be less open to manipulation and avoidance.

This latter point is an important dimension of any technology option. Relative to the status quo of fuel duty, which is collected at the pump and thus virtually impossible to avoid, any per mile system will likely face a higher possibility of leakage. However, this can be mitigated to a significant degree through technology options that submit readings automatically, such as in-car devices or GPS. Even the 'basic' option of milometer submissions can be cross-checked annually against a car's MOT, providing a strong deterrent against submitting false readings.

The best solution may well be allowing for a combination of technology options. For those users that have GPS already installed in their car (and are comfortable having their data used), this may be the easiest option. For other users, in-car devices for tracking mileage would likely be the preferred option, alongside the

174 See for example here
175 See for example here

submission of milometer readings for the most privacy-cautious. However, given the higher potential for avoidance, the latter option could be disincentivised, for example through a reduced free mileage allowance. Thus, any shortfall from revenue leakage could be made up for by effectively charging users who opt for the lower-tech option a higher rate.

Phase-in and potential 'test' users

Another important aspect of reform is how per mile charging would be phased in. Regardless of when exactly per mile charging is brought in, such a system could and should be introduced to a smaller subset of users first. These 'beta testers' could help work through any potential kinks in the technology or revenue collection, allowing for policy experimentation and more broadly introducing the idea of per mile charging to the public, rolling the pitch ahead of a wider roll-out.

> 'The best solution may well be allowing for a combination of technology options'

Who might fit the bill for such beta testing? One idea that has been raised in policy circles is HGV drivers, via a system modelled on the European road charging system. The EU has mandated the phasing out of the current time-based vignettes for heavy-duty vehicles (on the core Trans-European Network) by 2030, to be replaced by distance-based charges.[176] The UK's HGV levy also currently operates on a time basis, and could be replaced with a distance-based system.[177] The advantage of HGV drivers as test users is that they are already used to location tracking, and thus could make the transition relatively easily, allowing any bugs in the IT system to be worked out.

Another similar idea (not necessarily mutually exclusive) is to use corporate drivers as test users. Many people who use a vehicle for both business and leisure already have to track their mileage for tax purposes. HMRC has a threshold of 10,000 miles above which so-called 'Mileage Allowance Payments' (paid by employers to employees for using their own vehicle for business journeys) must be reported.[178] This necessitates the tracking of business travel miles, for example with a logbook or via an app. These drivers would thus be a natural set of beta testers for per mile charging and the accompanying infrastructure, both to record miles and allocate charges correctly.

One final idea (again not necessarily mutually exclusive) is the use of commercial passenger vehicles such as taxis or ridesharing services, potentially alongside consumer-facing delivery vehicles. While these drivers may not be as used to tracking their mileage as HGV or corporate drivers, their visibility to the public is higher than either of these and they could therefore serve a useful 'pitch rolling' function. However, there is a risk that by putting such charges first on businesses rather than individuals, the public will begin to see per mile charging as more of a corporate tax measure rather than a tax they themselves will eventually need to pay.

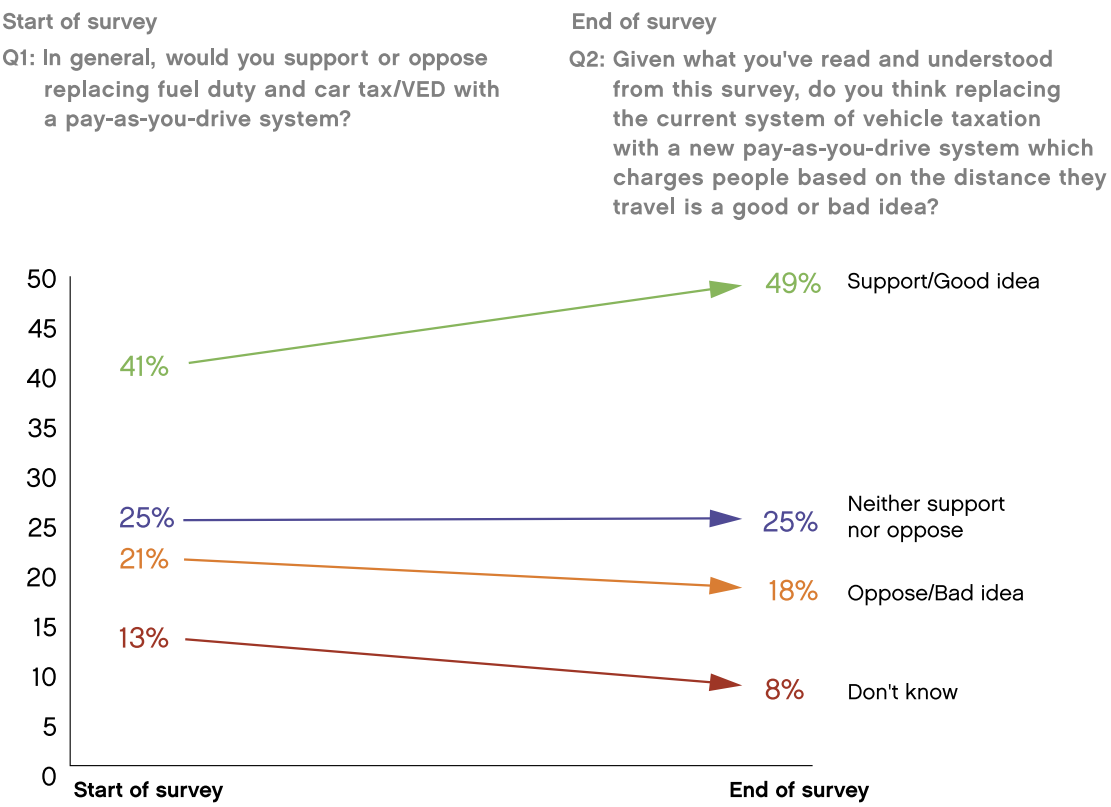
176 European Commission, '*Greening road transport: EU adopts new road charging rules*', February 2022. Link
177 Department for Transport, '*HGV Levy bands and rates tables*', December 2018. Link
178 Gov.uk, '*Expenses and benefits: business travel mileage for employees' own vehicles*', 2023. Link

Bringing the public onside

One final aspect that underpins this entire discussion is winning over the public. The spectre of Labour's failure in 2007, and of the ULEZ and congestion charge revolts, hangs over discussions of motoring taxation reform. Yet while there are crucial lessons to be learned from these experiences, there are also many reasons to believe that the public can be won over.

First, while some people instinctively or reflexively oppose changes to motoring taxation, once they engage with the issues and understand the solutions clearly, there is a notable shift in support. Polling conducted by Campaign for Better Transport shows this well – at the start of their survey, only 41% of respondents supported 'pay as you drive', but by the end of survey this had increased to 49%.[179] This suggests that given patient engagement and clear communication about the changes, public opinion can be swayed.

Change in support for pay as you drive between start and end of survey



Source: Campaign for Better Transport

There is obviously a clear need to build a coalition of stakeholders who will support these changes. Motoring organisations such as the RAC and AA will need to be brought onboard early and actively participate in building this new regime. The same applies for car manufacturers and other industry bodies, interested MPs, the devolved administrations and local governments, and of course the general public. The review or commission suggested by the Transport Select Committee would be an obvious place to start. We also need to ensure that cross-party consensus is maintained.

It is inevitable that any changes to motoring taxation, regardless of their form or impact, will face opposition. The only way to counter this and ultimately 'win the

179 Campaign for Better Transport, '*Pay-as-you-drive: The British public's views on vehicle taxation reform*', September 2022. Link Figure 3, page 13

argument' is through patient, clear and simple communication about the proposed changes – and of course ensuring that these changes are seen as fair and are not unduly punitive.

> **'There is a clear need to build a coalition of stakeholders who will support these changes'**

Supporters of per mile charging will need to repeatedly highlight core elements of the policy, for example that drivers will pay significantly less in motoring taxes than they do today. Drivers will also need to be reassured of their privacy and the security of their data.

Other policy recommendations

While this chapter has focused on per mile charging, there are other policy recommendations that we would support, based on this report's findings.

Building a unified technology platform for transport payments
We would strongly recommend that the Government integrate the payments back-end of various national and local schemes into a single 'road charges platform' hosted on gov.uk. From a citizen's perspective, paying per mile charges, clean air charges, congestion charges and other various road charges (parking, toll roads like the M6, Dart Charge) would all be integrated – one website, one set of login details, one direct debit. The various charges should be clearly set out individually, but the payments back-end should be identical. Ideally, this would apply across the UK, and work with devolved governments seamlessly.

Such a system would have several distinct advantages. Most importantly, it would simplify life for drivers in their daily commutes and trips to the shops, saving them time and removing the headache of having to remember which platform and which authority they need to pay after any given drive. It would also simplify cross-country trips to a large degree – right now London, for example, has its own TfL website to pay ULEZ and the Congestion Charge, which is different from the national site for most other cities in England, which is also different from the Scottish government site. A single unified payments platform would make cross-country journeys easier and reduce the risk of a penalty charge because a driver from elsewhere doesn't know about that city's specific congestion or clean air charges.

From a policy perspective an integrated payments platform would have the benefit of allowing local policymakers to experiment with new schemes, without demanding that everyone else do the same. For example, should more cities want to implement a congestion charge, much of the back-end infrastructure would already be in place to enable this. Such a system might even help with building support and take-up, as residents would not need to set themselves up on a new platform to pay the charges. The CPS is, of course, not the first to call for such a system – the 2017 Wolfson Prize focused on road pricing, and one of the finalists (Catriona Brown) proposed a similar idea (which she called 'T-forward').[180]

180 Brown, Catriona, '*How Can We Pay For Better, Safer, More Reliable Roads In a Way That is Fair To Road Users and Good For the Economy and the Environment?*', Wolfson Economics Prize and Policy Exchange, 2017. Link

It is important to recognise that putting in place such a system would represent a significant government IT and procurement effort. To be effective, the platform would need to be secure, efficient and user-friendly, as well as integrated successfully with a host of individual cities, councils and the devolved administrations. Yet this is not as insurmountable a barrier as one might think. For one thing, this kind of system does already exist for the majority of clean air zones in England. The site http://gov.uk/clean-air-zones allows users to check their vehicles for compliance, pay the charge and view maps of each zone for every CAZ save London's ULEZ. Additionally, the Government already collects VED via direct debit – this existing system could be repurposed and expanded. London's TfL website stands as an example of integrating several different schemes (ULEZ, LEZ for heavy vehicles, Congestion) into one unified 'London road user charging' system that works reasonably well for its citizens.

> **'From a citizen's perspective, paying per mile charges, clean air charges, congestion charges and other various road charges would all be integrated – one website, one set of login details, one direct debit'**

Another variation on this idea was put forward by the 2017 Wolfson winner, Gergely Raccuja. He proposed that rather than having government collect motoring taxes from individuals, you could delegate that task to insurance firms. After all, vehicles are already required to have insurance, and hence the firms have many of the relevant details, as well as the required payments infrastructure (and could be paid a small fee to collect the funds, like forecourt operators collecting fuel duty).[181] Moreover, many insurance plans already offer incentives for drivers to install a 'black box', offering telematic tracking and thus a more seamless user experience.

However, it seems that the public is suspicious of this idea – polling conducted by Campaign for Better Transport showed that having insurers collect the payments rather than government actually decreased support for pay-as-you-drive by 19%.[182] In focus groups, participants explained that they associate the insurance black boxes with an invasion of privacy via vehicle tracking, and also potentially being penalised for bad driving.[183] Absent a significant shift in public sentiment, it seems that a government system rather than a private one is the way forward.

Continue to support clean air zones – but learn from London's mistakes
The Government and local authorities should continue the hard work of bringing down air pollution through the use of charging clean air zones. However, local authorities should seek to incorporate lessons from the first generation of CAZs to build better schemes that bring public opinion alongside.

Newcastle has recently launched a zone (excluding private cars) covering the city centre alongside a dedicated website and a scrappage scheme with relatively wide eligibility.[184] Manchester looks likely to introduce a revised scheme (perhaps later this year), pending feedback from the national government.[185]

181 Raccuja, Gergely, '*Miles Better: A distance-based charge to replace Fuel Duty and VED, collected by insurers*', Wolfson Economics Prize and Policy Exchange, 2017. Link

182 Campaign for Better Transport, '*Pay-as-you-drive: The British public's views on vehicle taxation reform*', September 2022. Link Figure 9, page 23

183 Ibid, page 22

184 Newcastle City Council, '*Vehicle upgrade grants - eligibility criteria*', 2023. Link

185 Clean Air Greater Manchester, '*Greater Manchester Clean Air Plan*', 2023. Link

London has a further ULEZ expansion scheduled for August 2023, coupled with a much wider scrappage scheme (alongside dedicated radio adverts promoting it), and the possibility of public transit vouchers. But as set out earlier in this report, the rollout has not exactly been smooth. There are lessons to learn here not just about how to communicate the scheme, but about the need to minimise the financial burden, and ensure that those affected do have other options. The approach taken in London so far has largely flouted all the lessons we spelled out: the need to emphasise the goal of clean air, not the mechanism of charging; the need to stress that charging is a last resort, and that the aim of the scheme is for no one to pay the daily charge; and the need to avoid giving the impression that the scheme is designed to raise revenue, or that it is a form of taxation.

> **'While the statutory obligation to re-invest any excess funds into local transport and air quality related purposes is helpful, authorities should consider a more tightly focused regime'**

As we have seen, hypothecation can be an effective tool to blunt criticism that CAZs are simply stealth taxation. While the statutory obligation to re-invest any excess funds into local transport and air quality related purposes is helpful, authorities should consider a more tightly focused regime. Ideally, all excess funds should be invested directly into scrappage schemes, helping to expand the eligibility as widely as possible. Thus, users who choose to pay the charge would be directly subsidising those who want to upgrade their vehicles, helping to blunt criticism that CAZs are policies for the rich. Moreover, assuming this policy would raise the overall size of any scrappage scheme, it could help to increase uptake and get more polluting vehicles off the road, helping to accomplish the scheme's clean air goals more quickly.

Finally, the scrappage schemes themselves should be as flexible as possible. Recipients should be free to use the funds to purchase a new or used vehicle, or to lease a vehicle, as befits their individual circumstances. The alternative of public transportation (or active travel) vouchers should also be encouraged, giving users who no longer feel the need to drive the encouragement to shift modes. Similarly, eligibility for scrappage schemes should be drawn as widely as possible, ideally beyond only those on benefits (Birmingham's example of a £30,000 income threshold is sensible).

Next steps for congestion charging

Congestion charging is an effective tool to shift journeys away from peak hours where possible, increasing throughput and speeds and realizing the wider economic and societal benefits of lower congestion. This of course includes lower air pollution, particularly from the harmful $PM_{2.5}$ which stems substantially from brake and tyre wear. But again, there is a need to ensure that this is not seen as yet another front in the war on the motorist, or an attempt to extract yet more cash from those already suffering as cost of living pressures bite.

We firmly believe that while it is theoretically attractive to combine per mile charging and congestion charging into a super-sophisticated national system in which the overall price to drive is being constantly adjusted to reflect real-world events, this would be not just impractical in the short run but also risk damaging the brand of both congestion charging and per mile charging if pursued prematurely. Congestion charging, like clean air, is an issue best left to local leaders for the time being.

The unified payments platform we have recommended would make it easier for local authorities to set up congestion charging zones, given that much of the payments infrastructure will be in place and many local users will be familiar with the platform. We also recommend that the Department for Transport set up a dedicated team to work with local authorities on implementing such schemes. Given local governments are often under-resourced and will not have experience of managing congestion through charging schemes, a dedicated team could help bridge the gap and encourage take up. Down the line national government could also play a role in applying Singapore-style congestion pricing to motorways as needs arise.

‘Congestion charging, like clean air, is an issue best left to local leaders for the time being’

Of course, looking to the longer term, many see a dynamic congestion pricing system as the ultimate goal. This would allow for far more nuanced forms of pricing based on many factors, with the ability to change dynamically to adapt to traffic conditions. Ideally, drivers could pick a given route based on prices that would vary with duration times, allowing for a far more efficient usage of the roads.

While such a system may seem remote from the world we live in today, the technology is mostly available – what is missing is public acceptance. That said, there is no reason why the largest local congestion schemes (such as London’s) could not become ‘smarter’ themselves. The London Assembly recently consulted on ‘smarter road user charging’ for the capital, suggesting that a world in which flat daily charges are replaced with more sophisticated forms of road pricing – designed to smooth demand and ‘price in’ the externalities of driving – might not be all that far away. But as we said above, that is probably too big a distance to vault in one leap, at least on a national level.

Conclusion

To people up and down the country, driving is a fundamentally important part of their lives, whether for commuting, shopping, as a part of work or socialising. However, as this report has shown, there are deep issues with the state of motoring today, which will require new and innovative policy solutions.

From a taxation perspective, the rise of electric vehicles will pose a profound challenge to the nation's finances, as receipts from fuel duty begin to decline over this decade. Moreover, our roads can be heavily congested, particularly at peak times, while the air we breathe is still far too dirty, to a large degree because of motor vehicles.

'We recommend that the Government start preparing now for a shift to the world of per mile charging for zero emission vehicles'

As we have argued, clean air zones are an important and justified tool to tackle air pollution from motoring, much of which stems from older vehicles. By encouraging the drivers of such vehicles to upgrade to newer, cleaner ones, CAZs help particularly to reduce levels of NO_2, the health effects of which fall disproportionately on the medically vulnerable and elderly. As part of a wider air pollution strategy, they can help to save lives and make cleaner cities for everyone. Yet as recent events show, there is a pressing need to ensure that they are well-designed, well-communicated, and go with the grain of public opinion.

Clean air zones also offer crucial lessons when it comes to the long-term shift to per mile charging, which we believe holds out the prospect of a fairer, better and more efficient way of paying to drive.

As the rate of EV take-up increases over the coming decade, the introduction of an effective per mile charging system will become ever more urgent. It is therefore important that any future system is built on cross-party consensus with buy-in from industry, motoring organisations and the public.

We recommend that the Government start preparing now for a shift to the world of per mile charging for zero emission vehicles. ZEV motorists will pay significantly less than their petrol and diesel counterparts, going with the grain of carbon pricing and keeping a strong incentive for up-take. The Government should use this transition as an opportunity to rebalance taxation away from disproportionately penalising motorists in the medium term.

The new per mile system should be accompanied by a free mileage allowance above which the charges kick in, allowing for differentiation based on geography, while also adding a subtle nudge to reduce car usage. To avoid privacy concerns,

this national scheme should be based solely on the number of miles driven, irrespective of location or time.

While per mile charging will apply at the national level, we believe that clean air and congestion charging schemes should be kept at the local level, at least for now. Clean air and congestion are primarily local issues, and their intensity varies significantly by location. There is no one size fits all policy.

> **'The goal of faster, cleaner, more efficient roads has never been nearer. We should seize the opportunity'**

What's more, the shift to a nationwide system of per mile charging will be challenging enough as it is to implement. Trying to layer in clean air and congestion could over-complicate the scheme and risk scuppering the entire project.

The decline in fuel duty receipts offers the opportunity for a fundamental rethink of our approach to motoring policy, which we should welcome. By shifting to per mile charging we can build a more transparent and fair system nationwide, while continuing to push ahead with tackling air pollution and congestion at the local level. The goal of faster, cleaner, more efficient roads has never been nearer. We should seize the opportunity.

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