

## 9. A road map for motoring taxation

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### Key findings

- **Driving imposes costs on wider society. According to government estimates, the biggest of these by far is congestion (80% of the total).** Government estimates for 2015 suggest that each additional kilometre driven caused an average of 17p of societal harm. Other costs include accidents, greenhouse gas emissions, local air pollution and noise. While the additional cost of greenhouse gas emissions, at 1p per kilometre driven, may sound small, this still equates to £4 billion per year across the UK.
- **Fuel duties and the VAT paid on them account for more than four-fifths of revenue from motoring taxation and they are very well targeted at emissions. But they do a poor job of capturing the costs of congestion,** which vary hugely by time and place. Fuel duty rates are set higher than can be justified by emissions alone, but are much too low – and too poorly targeted – to reflect the costs of congestion.
- **Fuel duties have a roughly equal impact (as a share of spending) across the income distribution, but among car owners make up a greater share for lower-income households.** For nearly one household in twenty, fuel duties (and the VAT on them) make up a tenth of their total non-housing budget and for many driving is a necessity, one reason why this is an unpopular tax.
- **A 2p/litre cut in fuel duty rates would cost about £1 billion a year. But revenue from existing motoring taxes (which raise £40 billion a year) will all but disappear anyway in the next few decades** if the government's goal of achieving zero net emissions by 2050 is met.
- **This means the government needs to rethink how it taxes motoring. It should start now,** before the revenue disappears and expectations of low-tax motoring become ingrained. It should lay out how it plans to tax low-emissions driving in the long term whilst incentivising the take-up of lower-emissions cars in the short term.
- **A system of road pricing where charges vary by time and location is the best way to incorporate the costs of congestion into the prices paid by drivers.** Such systems are technologically feasible and are used in a number of cities worldwide. Failing that – or, better, as a stepping stone towards it – the government could introduce a flat-rate tax per kilometre driven, which would at least continue to raise revenue and discourage driving once alternatively fuelled vehicles replace petrol and diesel ones.
- **In the meantime, with conventionally fuelled cars still common, the government should move to monthly indexation of fuel duties in line with the Consumer Prices Index.** There is no case for the recurrent ritual of the past eight years, when planned inflation uprating of fuel duties has been repeatedly cancelled for one more year while assumed to recommence thereafter. But to tackle the harm that driving does, now and in the future, the government should look beyond the existing set of taxes.

## 9.1 Introduction

Taxes on motoring raise around £40 billion a year for the exchequer (around 5% of government revenue), equivalent to about £750 per adult in the UK. They also affect people's decisions about the vehicles they buy and how much, when and where they drive them. This is important because motoring gives rise to a number of social costs that would not otherwise be reflected in the prices people pay – such as congestion, greenhouse gas emissions, local air pollution, accidents and noise. Well-designed motoring taxes can be used to influence these behaviours and reduce the social costs associated with driving.

Most of the revenue from taxes on motoring comes from fuel duties, which in 2019–20 are expected to raise £28 billion in their own right. Fuel duties are also subject to VAT at the standard rate of 20%, which raises an additional £5.7 billion. Another £6.5 billion comes from vehicle excise duty (VED) and £0.2 billion from the London congestion charge.

Revenues from existing motoring taxes are threatened by ever-increasing fuel efficiency and the prospect of a widespread shift towards electric, hybrid and other alternatively fuelled cars. Good news for emissions is bad news for the government coffers. And improvements in fuel efficiency and the advent of alternatively fuelled cars are not the only ways in which the nature of motoring has been changing or is predicted to change:

- Among conventionally fuelled cars, the relative prevalence of petrol and diesel has shifted back and forth, encouraged by the government, in response to changing views on the environmental damage caused by the two fuels.<sup>1</sup>
- The provision of cars and fuel by companies for their employees' use has seen a long-term decline.
- Leasing cars rather than buying them outright is becoming more common among both businesses and households.
- The prospect of autonomous (driverless) cars in widespread use seems ever less distant, and may be accompanied by a shift away from traditional car ownership and use towards 'motoring as a service' (automated cars operating more like taxis but with more ride sharing and closer integration with public transport).

These actual and potential changes in the nature of motoring have wide-ranging implications both for the harms that it causes and for revenue from existing motoring taxes. Policy needs to respond appropriately. In this chapter, we examine both how satisfactorily tax policy treats motoring as we find it today and how it might be made ready for the future. Section 9.2 quantifies the social costs associated with motoring and Section 9.3 explains how motoring taxes can be used to incorporate these costs into the prices paid by people. In Sections 9.4–9.7, we discuss each of the four main current motoring taxes (fuel duties, vehicle excise duty, the London congestion charge and company car taxation) and the degree to which they accord with the economic principles

<sup>1</sup> Between 2002 and 2012, the number of new diesel cars sold in the UK almost doubled from half a million to a million while the number of petrol cars halved from over two million to less than one million; the number of petrol cars has been rising since then, while the number of diesel cars has fallen sharply since 2017 ('Cars registered for the first time by propulsion and fuel type: Great Britain', <https://www.gov.uk/government/statistical-data-sets/veh02-licensed-cars>).

set out in Section 9.3. Section 9.8 rounds up the discussion by considering the challenges for the government going forward and how it should reform motoring taxes to reflect better the true costs of motoring. Section 9.9 concludes.

In this chapter, we restrict our attention to cars. Many of the same considerations apply to other forms of road transport such as lorries and motorbikes, though there are some differences in the policy environment and the societal costs of these forms of transport which affect policy considerations.

## 9.2 The social costs of motoring

Motoring has a number of wider costs to society (known as externalities) that are not reflected in the prices that people pay. These costs include congestion, accidents, greenhouse gas emissions, noise and local air pollution. One important rationale for motoring taxes is that they can help to discourage the behaviour that gives rise to these costs.

### How big are these social costs and how are they changing?

Table 9.1 shows the Department for Transport's official estimates of the average externality from a marginal (i.e. one extra) kilometre (km) driven in Great Britain, in 2015 and 2025. Despite the focus on emissions in public policy debate, these figures show that congestion is by far the largest component of the external cost of additional driving, accounting for almost 80% of the total in 2015. The exact numbers are highly debatable: it is difficult to put a precise cash figure on the cost of greenhouse gas emissions or time spent in traffic jams.<sup>2</sup> But all serious estimates (both academic and official) that we know of tell this same basic story. This is not to downplay the problem of climate change or air pollution: an externality of 1p/km still values emissions from cars at £4 billion per year.<sup>3</sup> Rather, it highlights how much of people's time is wasted sitting in traffic that is created collectively by other drivers. This is time that people could spend producing valuable goods and services, or enjoying precious time at home and leisure pursuits.

As shown in Table 9.1, the cost of congestion is expected to rise over the next few years, even as the costs related to greenhouse gas emissions and local air pollution are expected to fall. Those trends are expected to continue for at least another decade after that. The congestion forecasts are based on an expected rise in the number of vehicles on the road and the distance travelled by each, and an expected fall in available road space due to its allocation to buses, cyclists or roadworks.<sup>4</sup> They also assume that the value of people's

<sup>2</sup> The valuation of emissions in Table 9.1 is based on the standard estimate of the cost of carbon provided in the 'Green Book' guidance for government appraisal. The valuation of time lost to congestion is ultimately derived from questionnaires asking respondents to choose between hypothetical slower-but-cheaper and quicker-but-dearer options (and estimated separately for working and non-working time, etc.).

<sup>3</sup> This is simply 1p for each of the 410 billion kilometres driven by cars in 2018 according to Department for Transport, 'Road traffic statistics (TRA02)', 14 May 2019, <https://www.gov.uk/government/statistical-data-sets/road-traffic-statistics-tra>. In the context of global greenhouse gas emissions, it seems reasonable to assume that the cost of emissions from the first kilometre driven in the UK is the same as that from the last.

<sup>4</sup> Department for Transport, 'TAG UNIT A5.4: marginal external costs', 2014, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/286935/webtag-tag-unit-a5-4-marginal-external-congestion-costs.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/286935/webtag-tag-unit-a5-4-marginal-external-congestion-costs.pdf).

**Table 9.1. External costs of motoring (2019–20 prices)**

	Marginal external cost of motoring (pence/km)		% of total	
	2015	2025	2015	2025
Congestion	13.2	20.3	77.9	82.9
Accidents	2.2	2.9	13.1	11.9
Greenhouse gases	0.9	0.8	5.5	3.3
Local air quality	0.3	0.1	2.1	0.5
Noise	0.1	0.2	0.7	1.0
Infrastructure	0.1	0.1	0.7	0.5
<i>Total</i>	<i>16.9</i>	<i>24.5</i>	<i>100</i>	<i>100</i>

Note: Figures are for cars only.

Source: Table A5.4.2 of Department for Transport, WebTAG Databook, May 2019, converted to 2019–20 prices using the GDP deflator.

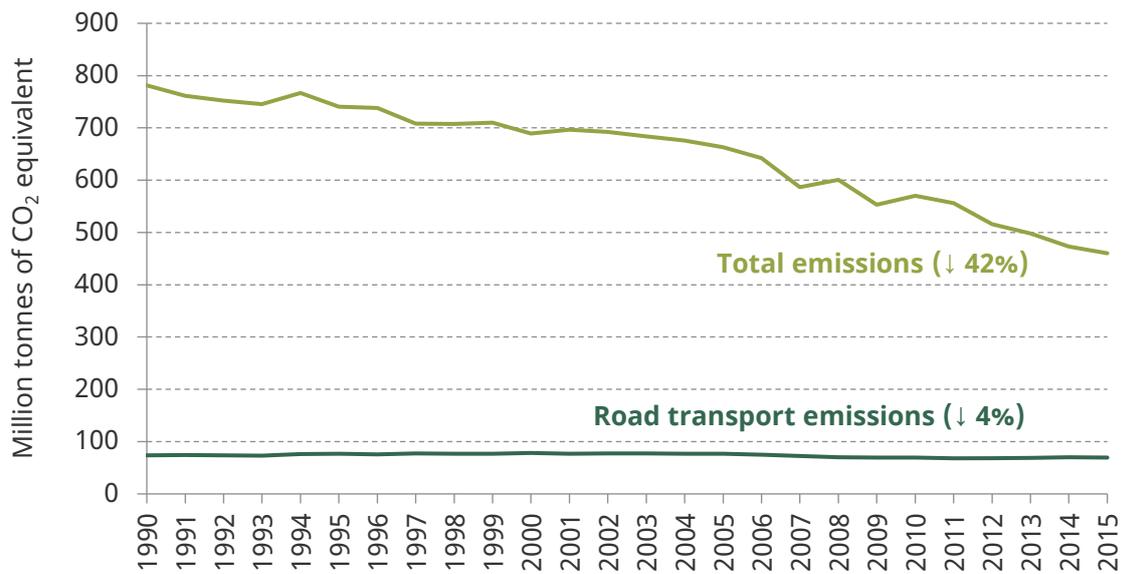
time spent in congestion will increase in line with national income per person.<sup>5</sup> Note that the forecasts ignore the advent of autonomous vehicles and possible shifts towards motoring as a service. There is no consensus as to how these will affect congestion, though the change could be substantial.<sup>6</sup> But unless the number of cars on the road drastically decreases, it is likely that congestion will remain the biggest external cost of motoring for the foreseeable future.

While congestion deserves more attention, the focus on emissions in the public and policy debate is not misplaced. Climate change is one of the biggest challenges facing the world in the coming decades, and motoring accounted directly for 15% of the UK's greenhouse gas emissions in 2017. This is up from 9% in 1990 since, as shown in Figure 9.1, the UK's progress in reducing other greenhouse gas emissions (such as from the energy sector) has not been matched in emissions from motoring.<sup>7</sup>

<sup>5</sup> Department for Transport, *Road Transport Forecasts 2018*, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/740399/road-traffic-forecasts-2018.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/740399/road-traffic-forecasts-2018.pdf).

<sup>6</sup> G. Raccuja, 'Miles better', Wolfson Economics Prize winner, 2017, <https://policyexchange.org.uk/wolfson-winner/> points out a number of factors that might increase congestion (cars becoming cheaper and less troublesome to drive, access to private vehicles for groups currently unable to drive, substitution from public transport to ride sharing) and a number of factors that might reduce congestion (more efficient driving, fewer accidents, different ownership structures encouraging more ride sharing and bus-like travel, movement of freight travel to night time). The likely net effect of these competing forces is unclear.

<sup>7</sup> These figures include vehicles' exhaust pipe emissions, but not the emissions from their manufacture or in generating electricity for plug-in or battery-operated cars. These emissions are important but are not separately identified in these data.

**Figure 9.1. UK greenhouse gas emissions (CO<sub>2</sub> equivalent)**

Note: 'Equivalent CO<sub>2</sub> emissions' indicates the quantity of CO<sub>2</sub> emissions that would have the equivalent global warming impacts to the combination of greenhouse gases that was emitted. Numbers in parentheses show the fall from 1990 to 2017.

Source: Department for Business, Energy & Industrial Strategy, 'Final UK greenhouse gas emissions national statistics: 1990-2017', 2019, <https://www.gov.uk/government/statistics/final-uk-greenhouse-gas-emissions-national-statistics-1990-2017>.

The expected fall in the emissions cost of motoring shown in Table 9.1 reflects forecast changes in the number of vehicle-kilometres driven per year and changes in emissions per kilometre. This fall is likely to be seen not only in the next five years but also in the longer term: the government has committed to reaching zero net emissions for the UK as a whole by 2050, and given motoring's contribution to UK emissions, decarbonising road transport must inevitably play a major role in that. In 2018, the government published *The Road to Zero*, its strategy for moving to zero-emission road transport.<sup>8</sup> Its targets include:

- 50–70% of new cars being ultra-low emission by 2030;
- banning the sales of new conventional petrol and diesel cars by 2040;
- 'almost every car' being zero-emission by 2050.

We are currently a long way from reaching any of these goals. Although there was a 22% increase in the number of alternatively fuelled new cars registered last year, they still make up only 6% of all new cars registered, and around two-thirds of these are hybrids, meaning that they still give rise to some emissions.<sup>9</sup> The UK Energy Research Centre found that the 2040 ban on sales of conventionally fuelled cars will not be enough to eliminate emissions from cars by 2050 and is unlikely to result in even an 80% reduction, because

<sup>8</sup> <https://www.gov.uk/government/publications/reducing-emissions-from-road-transport-road-to-zero-strategy>.

<sup>9</sup> Department for Transport, 'Vehicle licensing statistics: 2018', 2019, <https://www.gov.uk/government/statistics/vehicle-licensing-statistics-2018>.

many cars remain on the road for longer than 10 years and because the ban does not apply to hybrid cars.<sup>10</sup> In order to meet the 2050 target, the Climate Change Committee and two parliamentary Select Committees (the Science and Technology Committee and the Business, Energy and Industrial Strategy Committee) have all recommended that the ban be brought forward (to 2035, 2035 and 2032 respectively) and that it should apply to hybrids as well as conventional petrol and diesel cars.<sup>11</sup> As electric vehicles become more widespread, it will become increasingly important that the electricity powering these vehicles is also generated in a clean way.

Alongside tax policy, a key factor driving falling greenhouse gas emissions per kilometre is ever-tightening regulations. The latest EU rules – which the UK has signed up to regardless of the Brexit outcome – require car makers to reduce the average emissions of the cars they sell across the EU from 120gCO<sub>2</sub>/km in 2018 to 95gCO<sub>2</sub>/km by 2021,<sup>12</sup> with even more stringent limits for 2030. Eye-watering fines for missing these targets mean that car makers are making strenuous efforts to meet them. But they will be extremely challenging, and in fact greenhouse gas emissions of new cars actually rose in 2017 and 2018 (after falling consistently for many years) because of a shift from diesel to petrol cars (discussed further in Section 9.5), which cause less local air pollution but more greenhouse gas emissions.

EU regulations have been just as important in driving reductions in local air pollutants as greenhouse gas emissions. The Department for the Environment, Food and Rural Affairs found that emissions of nitrogen oxides and particulates from road transport fell by 77% and 50% respectively from 1990 to 2017.<sup>13</sup> With the introduction of the latest standards, Table 9.1 shows that the costs of local air pollution are expected to fall by another two-thirds from 2015 to 2025, an even more rapid decline than for greenhouse gas emissions.

### How do these social costs vary across journeys?

Table 9.1 shows the *average* external costs of each kilometre driven (holding all other driving constant in each case). But the costs of any particular journey depend not only on how long the journey is, but also on when and where it takes place and on what type of car is being driven.

<sup>10</sup> UK Energy Research Centre, 'Review of energy policy: 2018', 2018, <http://www.ukerc.ac.uk/publications/review-of-energy-policy-2018.html>.

<sup>11</sup> Committee on Climate Change, 'Net Zero: the UK's contribution to stopping global warming', 2019, <https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/>; House of Commons Science and Technology Committee, 'Clean growth: technologies for meeting the UK's emissions reduction targets', <https://www.parliament.uk/business/committees/committees-a-z/commons-select/science-and-technology-committee/news-parliament-2017/clean-growth-report-published-17-19/>; House of Commons Business, Energy and Industrial Strategy Committee, 'Electric vehicles: driving the transition', <https://www.parliament.uk/business/committees/committees-a-z/commons-select/business-energy-industrial-strategy/news-parliament-2017/electric-vehicles-report-published-17-19/>.

<sup>12</sup> The target is higher for companies making big cars and lower for those making small cars, and companies can also pay each other to pool their measured emissions, in effect buying the headroom that another manufacturer might have against the target. See [https://ec.europa.eu/clima/policies/transport/vehicles/cars\\_en](https://ec.europa.eu/clima/policies/transport/vehicles/cars_en).

<sup>13</sup> Authors' calculations using [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/778483/Emissions\\_of\\_air\\_pollutants\\_1990\\_2017.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/778483/Emissions_of_air_pollutants_1990_2017.pdf).

Greenhouse gas emissions are generated by fuel consumption, so are lower for more fuel-efficient cars, and also vary by fuel type. Diesel cars typically give rise to 15–20% less CO<sub>2</sub> than petrol cars per kilometre driven (despite giving off more CO<sub>2</sub> per litre of fuel burned)

**Table 9.2. Marginal congestion externality by road type, 2015 (in 2019–20 prices)**

	Marginal congestion externality (p/km)	% of total traffic
London motorways	0.1	0.3
London A roads	80.6	3.5
London other roads	53.5	2.5
Conurbations motorways	1.9	4.6
Conurbations A roads	38.4	6.1
Conurbations other roads	27.4	7.0
Urban A roads	15.5	12.3
Urban other roads	12.0	12.5
Rural motorways	1.1	14.1
Rural A roads	2.6	23.2
Rural other roads	3.4	14.0
<i>Overall</i>	<i>13.2</i>	<i>100</i>

Note: Figures are for cars only. Conurbations include major cities outside London such as Birmingham and Manchester and their surrounding areas. Urban areas are defined as smaller cities and towns. Full details are given in Department for Transport, 'TAG UNIT A5.4: marginal external costs', 2018, <https://www.gov.uk/government/publications/webtag-tag-unit-a5-4-marginal-external-costs-may-2018>.

Source: Tables A5.4.1 and A5.4.2 of Department for Transport, WebTAG Databook, May 2019, converted to 2019–20 prices using the GDP deflator.

**Table 9.3. Marginal externality of congestion by period, 2015 (in 2019–20 prices)**

	Marginal congestion externality (p/km)	% of total traffic
Mon–Fri peak AM	19.1	15.9
Mon–Fri inter-peak	12.7	24.2
Mon–Fri peak PM	21.1	18.8
Mon–Fri other	5.7	15.4
Sat–Sun average	12.9	25.6
<i>Overall</i>	<i>13.2</i>	<i>100</i>

Note: Figures are for cars only. Peak hours are 7:00a.m. to 10:00a.m. and 4:00p.m. to 7:00p.m.

Source: Tables A5.4.3 and A5.4.4 of Department for Transport, WebTAG Databook, May 2019, converted to 2019–20 prices using the GDP deflator.

as they tend to require less fuel to cover a given distance.<sup>14</sup> Alternatively fuelled vehicles (most of which are hybrid cars) emit, on average, 45% less CO<sub>2</sub> than the average car on the market,<sup>15</sup> with electric cars having zero emissions at the point they are driven. Despite outperforming petrol cars in terms of greenhouse gas emissions, diesel cars (particularly old diesel models) perform far worse than petrol cars in terms of the local air pollution they generate.<sup>16</sup>

Other costs such as congestion, noise and accidents depend not on car type but on when and where the journey takes place. Table 9.2 shows how the marginal congestion externality varied, on average, across different types of road and parts of Great Britain in 2015. The costs of congestion are particularly high on London A roads: over six times the average and 25–75 times larger than in rural areas. These are averages over all roads within these broad categories and across all times of day, so will drastically understate the variation in cost of congestion. Table 9.3 shows that the average externality also varies substantially across time of day. As we discuss further in Section 9.4, most driving creates minimal congestion costs; the vast majority of these costs is generated by a very small proportion of journeys.

### 9.3 Using taxes to correct for the external costs of motoring

Motoring taxes bring in valuable revenue for the government. But the rationale for levying taxes specifically on motoring, rather than getting the revenue from more general taxes, is because of the harm that motoring does to wider society. The aim of motoring taxation should be to apply a price to driving that reflects the costs it imposes on others (as described in Section 9.2), so that the driver ‘internalises’ the external cost of her behaviour. An appropriately designed system of motoring taxation means that people will be induced to take appropriate account of the social consequences of their actions when choosing whether to buy a car and which one, and how much, when and where to drive it.

An advantage of using taxation in this way (rather than, say, mandating particular behaviour) is that it reduces social harms in an efficient way – that is, in whatever way drivers find easiest. Driving a particular car, or at a certain time and place, is so important to some people that it is worth their doing it despite the harms imposed on others. Put another way, the driver would in principle be willing to pay others enough to offset the harm imposed on them. Putting a price on the externality is essentially a version of this: drivers are asked to pay a price that reflects the harm their behaviour does to others, and can choose either to pay the price (if it is worth it to them) or to change their behaviour. This means that congestion or emissions will be reduced most by those who find it easiest to do so, minimising the costs of behaviour change and maximising people’s well-being.

This explains how motoring taxes can, in theory, be used to reduce driving’s costs to society in an efficient way. But in practice, doing this effectively requires targeting the externalities accurately. Badly targeted taxes will change the wrong behaviours, imposing costs of unnecessary behaviour change and reducing success in mitigating true social harms. In an ideal world, the government would tax each kilometre driven by exactly the

<sup>14</sup> SMMT, ‘New car CO<sub>2</sub> report 2018’, <https://www.smmt.co.uk/wp-content/uploads/sites/2/SMMT-New-Car-Co2-Report-2018-artwork.pdf>.

<sup>15</sup> Ibid.

<sup>16</sup> <https://www.racfoundation.org/motoring-faqs/environment>.

same amount as the social costs it generates. But in practice, since the social costs of motoring vary a lot depending on when, where and in what kind of vehicle a journey takes place, to implement the ideal system the government would need both very good information on social costs and a very flexible tax system to take them into account. This is usually impractically hard.

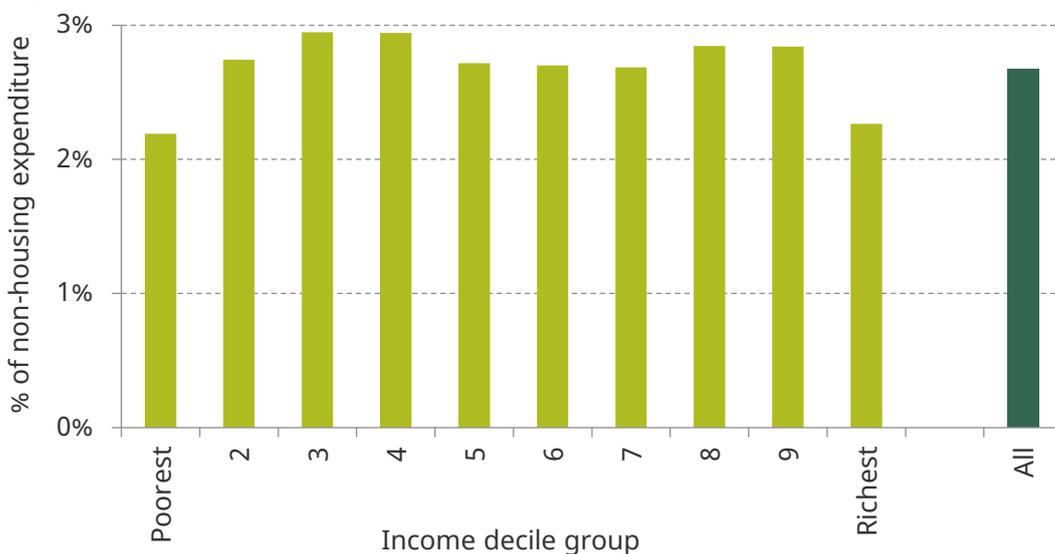
Instead, policymakers look for something closely related to the externality that can more easily be measured and taxed. Greenhouse gas emissions closely mirror fuel use, meaning that a tax on fuel is well targeted at reducing emissions. Congestion, on the other hand, varies enormously by time and place in a way that, among our existing motoring taxes, only the London congestion charge even attempts to capture.

In the next four sections, we assess the UK's existing motoring taxes, with a particular focus on how well they target the externalities created by driving. We then turn in Section 9.8 to consider how motoring taxation might be reformed to address the challenges of the future.

## 9.4 Fuel duties<sup>17</sup>

Petrol and diesel are subject to excise duties of 57.95p/litre. Additionally, VAT is charged at the standard 20% rate on the price of fuel including the duty itself, meaning that 69.54p more tax is paid due to fuel duties than would be in their absence. No fuel duty is paid on electricity used by electric or hybrid vehicles and this electricity is also subject to a reduced VAT rate of 5%.

**Figure 9.2. Distributional impact of fuel duty + VAT on duty**



Source: Authors' calculations using TAXBEN run on updated data from the 2015 Living Costs and Food Survey.

<sup>17</sup> Parts of this section draw heavily on S. Adam and T. Waters, 'Options for raising taxes', in C. Emmerson, C. Farquharson and P. Johnson (eds), *The IFS Green Budget: October 2018*, <https://www.ifs.org.uk/publications/13495>.

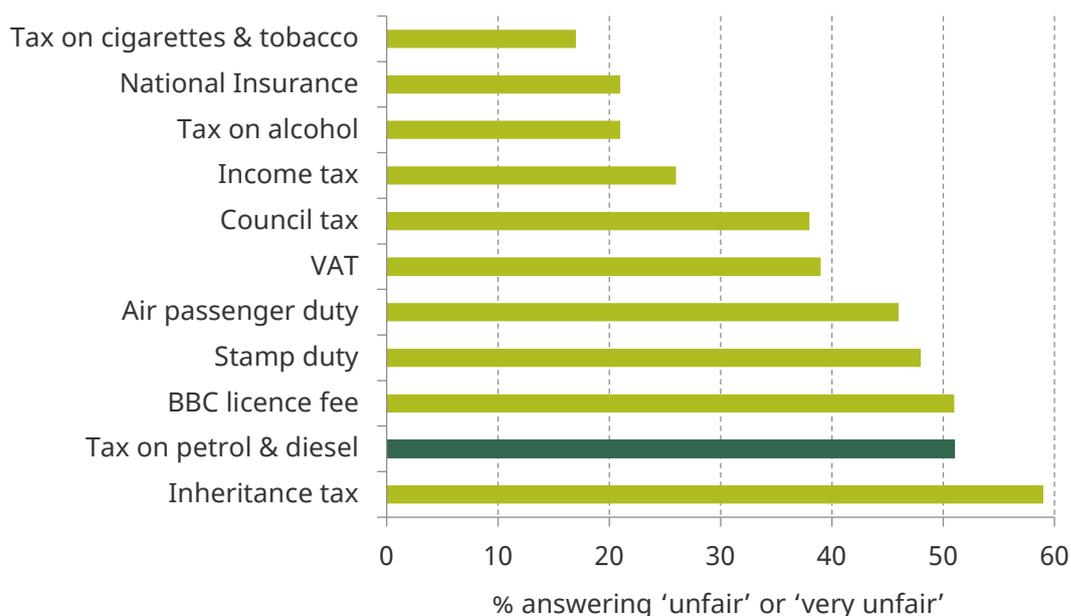
Figure 9.2 shows that the duties paid on households’ fuel purchases are, on average, roughly proportional to household spending, accounting for between 2% and 3% of the non-housing budget for all income groups. Among car owners, fuel duties take up a larger share of poorer households’ budgets. But since lower-income households are much less likely to own a car in the first place (in 2015 only half of those in the lowest income decile owned a car, compared with over 90% in the highest income decile), the average budget share across all households is broadly constant over the income distribution (though slightly lower for the poorest tenth and the richest tenth).

The burden of fuel duties varies widely within income groups. Right across the income distribution, around 4–5% of households find fuel duties (and VAT on the duties) consuming more than a tenth of their budget, and it is for these people that rates of fuel duties are a particularly sensitive issue.

The distributional impact of fuel duties paid by firms is harder to estimate: the duties are likely to increase the prices of goods and services that require transport, so it depends what kinds of households disproportionately buy the goods and services that require more road fuel to supply.

Whatever its distributional impacts, the unpopularity of fuel duties is clear. A 2015 YouGov survey (see Figure 9.3) found that just over half of respondents thought fuel duties were unfair; only inheritance tax received a more unfavourable response. It is particularly striking when contrasted with tobacco duties, which are highly regressive and which many economists would bracket with fuel duties as ‘corrective taxes’ designed to discourage harmful behaviour, but which were considered the fairest of the taxes listed. Evidently the harms that motoring causes do not make people think of fuel duties as a legitimate ‘sin tax’ like alcohol or tobacco duties. One reason for this may be that many people feel they

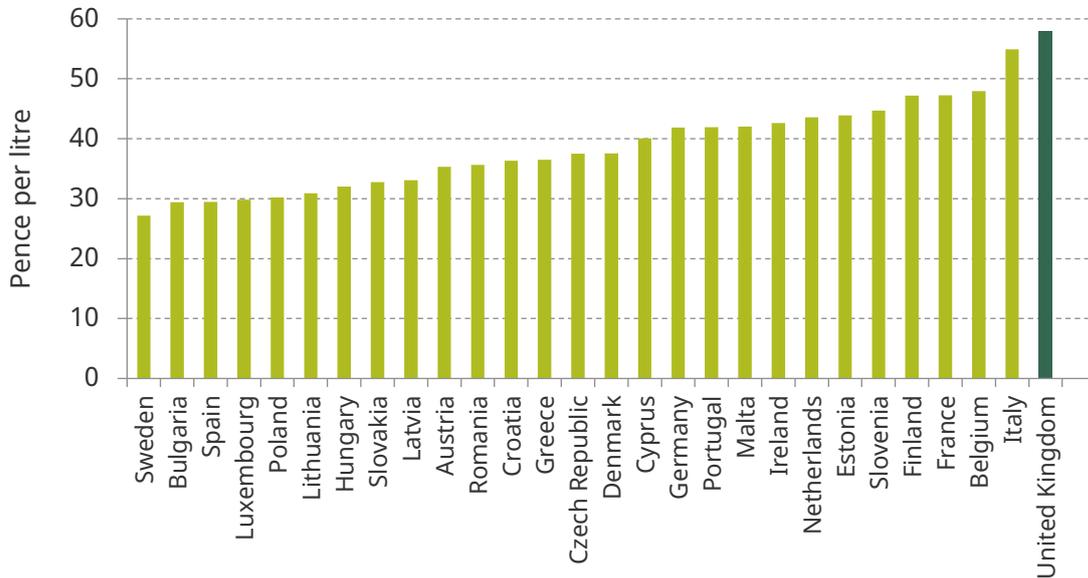
**Figure 9.3. ‘How fair or unfair do you think the following types of taxation are?’**



Source: YouGov / Times Red Box Survey, March 2015, [https://d25d2506sfb94s.cloudfront.net/cumulus\\_uploads/document/j9x8nbtks7/TimesRedBoxResults\\_150318\\_taxation\\_Website.pdf](https://d25d2506sfb94s.cloudfront.net/cumulus_uploads/document/j9x8nbtks7/TimesRedBoxResults_150318_taxation_Website.pdf).

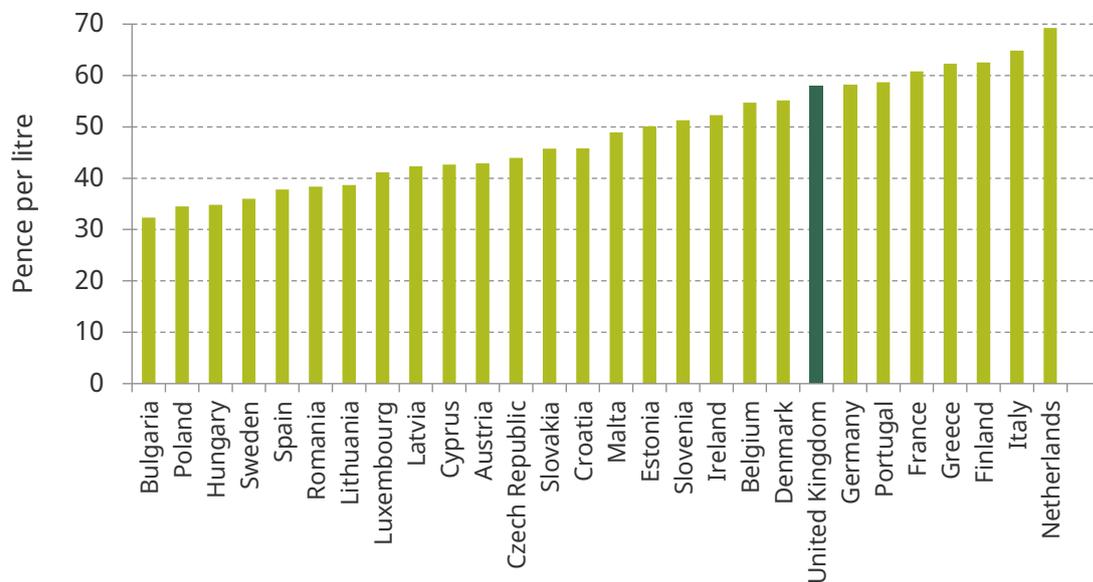
have little option but to drive – it may be their only way to get to work, for example – and resent being penalised for something they can do nothing about.

**Figure 9.4. Diesel duties across the EU, 2018**



Source: Fuel duty rates for all EU countries except the UK taken from [https://www.eea.europa.eu/data-and-maps/daviz/road-fuel-excise-duties-5#tab-chart\\_1](https://www.eea.europa.eu/data-and-maps/daviz/road-fuel-excise-duties-5#tab-chart_1) (converted to pence at latest exchange rates). UK rates as stated by government.

**Figure 9.5. Petrol duties across the EU, 2018**



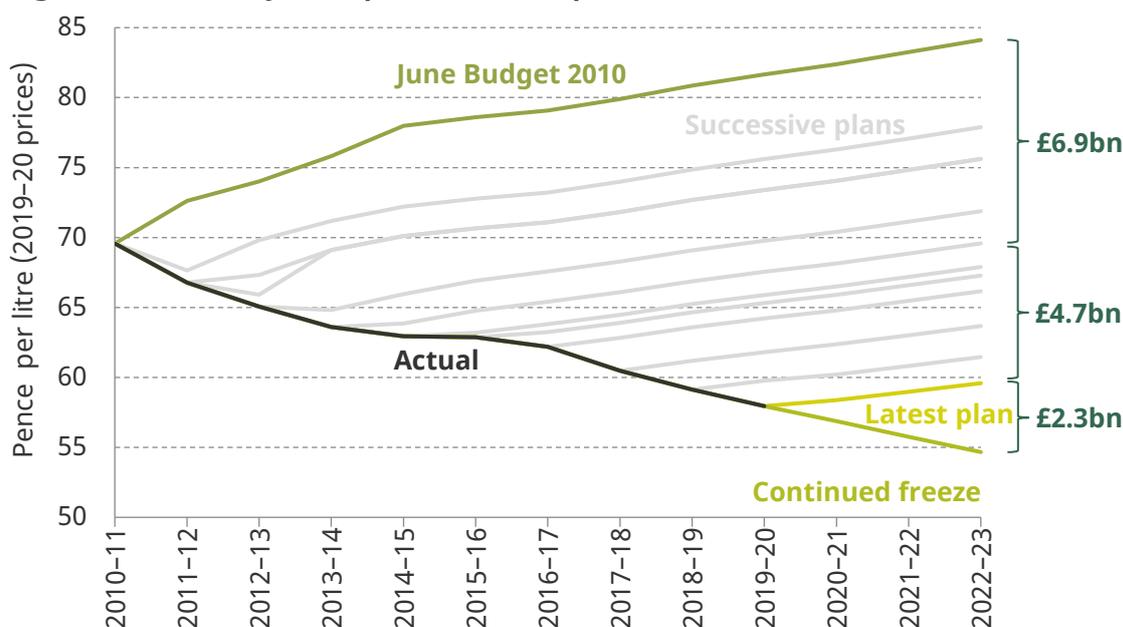
Source: Fuel duty rates for all EU countries except the UK taken from [https://www.eea.europa.eu/data-and-maps/daviz/road-fuel-excise-duties-5#tab-chart\\_1](https://www.eea.europa.eu/data-and-maps/daviz/road-fuel-excise-duties-5#tab-chart_1) (converted to pence at latest exchange rates). UK rates as stated by government.

Rates of fuel duties in the UK are high by international standards. The duty on diesel is the highest in the EU (see Figure 9.4), though since most other countries tax petrol more heavily than diesel, the UK’s petrol duty is ‘only’ the eighth highest in the EU (Figure 9.5).

The UK’s rates of fuel duties have remained high by international standards despite substantial real-terms reductions in recent years. The government’s public finance forecasts assume that fuel duties increase each April in line with the Retail Prices Index (RPI). However, Figure 9.6 – which shows the real value of fuel duties (relative to CPI inflation) under successive government plans – makes clear that is not what has happened. In April 2011, the coalition government cancelled the series of real-terms increases that the previous Labour government had pencilled in and instead cut the rate by a penny per litre, and it has been frozen in nominal terms ever since – meaning that fuel duties have fallen by 17% in real terms since 2010–11 (at a cost to the exchequer of £5.5 billion in 2019–20), and by 29% relative to the plans that the coalition inherited (at a cost to the exchequer of £11.2 billion).<sup>18</sup>

But this freeze was not laid out in advance. Instead, the government has repeatedly delayed or cancelled imminent fuel duty rises but maintained the assumption that, from

**Figure 9.6. Fuel duty rates planned and implemented**



Note: Revenue figures are the difference in revenue in 2022–23 (expressed in 2019 prices) between (from top) the June Budget 2010 plan and no real change after 2010–11 (£6.9 billion), no real change and the government’s latest plan (£4.7 billion) and the government’s latest plan and a continued nominal freeze (£2.3 billion).

Source: Authors’ calculations using OBR, *Economic and Fiscal Outlook: March 2019* and HMRC, ‘Direct effects of illustrative tax changes’, April 2019, <https://www.gov.uk/government/statistics/direct-effects-of-illustrative-tax-changes>.

<sup>18</sup> Note that the difference between these two numbers reflects the difference between RPI and CPI inflation as well as Labour’s small proposed ‘discretionary’ increases. Revenue effects of fuel duty changes in this section are calculated by the authors using HMRC, ‘Direct effects of illustrative tax changes’, April 2019, <https://www.gov.uk/government/statistics/direct-effects-of-illustrative-tax-changes>.

the following year, duties would be uprated in line with RPI inflation – only to repeat the same exercise a year later. The steady fall in real fuel duty rates shown in Figure 9.6 has never been the government’s officially stated plan (with successive plans shown by the grey lines in the figure).

In light of this recent history, it is not surprising that the Office for Budget Responsibility’s (OBR’s) recent Fiscal Risks Report put the probability of further real reductions at over 90%.<sup>19</sup> Freezing fuel duties until the end of the five-year parliament would reduce annual revenue by £2.3 billion by 2022–23 (relative to RPI uprating), and recent reports suggest the government is thinking of going further and cutting fuel duties by 2p/litre,<sup>20</sup> which would cost about another £1 billion a year.

Regardless of whether the government chooses to increase or reduce fuel duties, it should still routinely adjust them to reflect inflation. Freezing fuel duties in nominal terms has the odd consequence that the degree to which fuel duties rise or fall in real terms depends on the rate of inflation, instead of being the result of deliberate policy. Uprating of fuel duties should be resumed and should be carried out in line with the CPI rather than the discredited RPI measure (which overstates the rate of inflation, as shown by the upwards slopes of the grey lines).

One reform the government could consider would be to uprate fuel duties monthly rather than annually. This would separate out routine inflation uprating from policy decisions, rightly taken in the Budget, as to whether real rates of duty should be increased or reduced. It would have little direct effect on revenue, but more gradual inflation uprating would more accurately keep the real rates of duty constant and would reduce the political pressures currently associated with sharp annual uprating. If it made more credible the ‘plan’ to index rates of duties then, over time, it could raise revenue and reduce uncertainty over future tax rates.

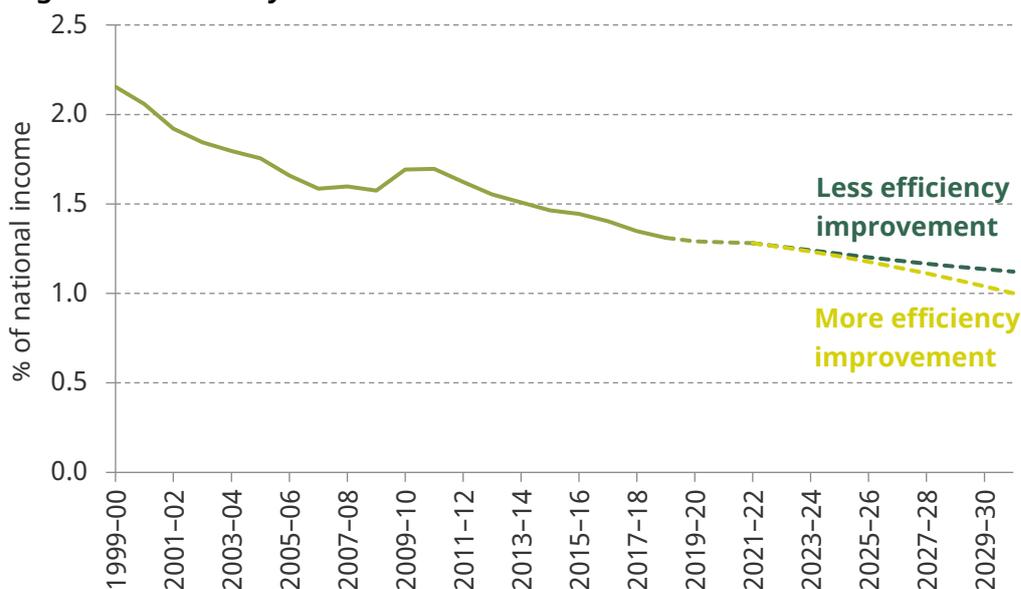
Fuel duties are expected to raise £28.4 billion in 2019–20, with an additional 20% (£5.7 billion) from VAT on the duties. This makes fuel duties by far the most important source of revenue from motoring taxes, even though revenue from fuel duties has fallen from 2.2% of national income in 1999–2000 to 1.3% this year (a fall equivalent to £19 billion in today’s terms). This fall has been driven by the combination of the nominal freeze in duty rates and improvements in the fuel efficiency of vehicles. As cars become more fuel-efficient, less fuel is needed to travel the same distance, reducing the average fuel duty paid per kilometre driven. This trend is set to continue, both as conventionally fuelled cars continue to become more fuel-efficient and as they get replaced by alternatively fuelled cars.

How quickly the revenue from fuel duties declines depends on the pace of this shift towards lower-emissions motoring; Figure 9.7 shows OBR forecasts from 2017 under a ‘less efficiency improvement’ scenario (fuel efficiency improving in line with recent trends, reaching 95gCO<sub>2</sub>/km in 2030) and a ‘more efficiency improvement’ scenario (consistent with the Committee on Climate Change recommendation of reaching 50gCO<sub>2</sub>/km by 2030). Both scenarios show that revenues will continue to decline, but not fall to zero any

<sup>19</sup> OBR, *Fiscal Risks Report: July 2019*, <https://obr.uk/frr/fiscal-risks-report-july-2019/>.

<sup>20</sup> <https://www.thesun.co.uk/news/9797158/boris-johnson-slash-fuel-duty/>.

**Figure 9.7. Fuel duty revenue 1999–2017 and OBR forecasts to 2030**



Note: OBR forecasts assume annual RPI uprating resumes.

Source: HMRC statistics; OBR, Public Finances Databank; OBR, *Fiscal Risks Report: July 2017*; authors' calculations.

time soon – though both scenarios assume that fuel duty rates will be uprated annually in line with RPI inflation, which the OBR itself regarded as highly unlikely.<sup>21</sup>

In any case, such a gradual decline in revenues continuing after 2030 is not compatible with the government’s 2050 target of zero net emissions. If this target is to be achieved, then the tax base for traditional fuel duties will have to disappear altogether in the coming decades.

### Do fuel duties accord with economic principles?

Since fuel duties are proportional to fuel consumption, they are perfectly designed to target the direct (exhaust) emissions from driving – though they do not, of course, capture the emissions associated with electricity generation for hybrid and electric cars.

As described in Section 9.3, a tax that is proportional to emissions encourages the people who find it easiest to reduce emissions to do so in whichever way they find easiest. People could reduce their emissions by 10% either by buying a 10% cleaner car or by driving 10% less. From the point of view of emissions reduction these are equally good outcomes; the better outcome would be whichever of these the individual prefers. Fuel duties give the same incentive to do both, and so the individual will indeed do whichever they find easier.

Set at the right level, fuel duties could therefore effectively incorporate the social costs of emissions into the prices faced by consumers. And people do respond to these incentives: one review of the evidence concluded that a 10% rise in the fuel price cuts the amount of

<sup>21</sup> The OBR’s 2019 Fiscal Risks Report stated that its revised revenue forecasts were now slightly higher in all scenarios, but did not give exact numbers corresponding to its 2017 forecasts and in any case the difference between the two scenarios would remain.

fuel consumed by 2.5% in the first year and by 6% in the longer term, once people have had more chance to switch to smaller or more fuel-efficient cars.<sup>22</sup>

But if fuel duties are intended only to correct for emissions-related costs, then they are currently set too high. On the government's estimates, in 2015 the combined marginal external cost of greenhouse gas emissions and local air pollution was barely a sixth of the average amount of fuel duty (plus VAT on fuel duties) paid per kilometre driven (1.2p/km compared with 7.0p/km).<sup>23</sup>

If, on the other hand, fuel duties are intended to correct, at least on average, for all the other social harms from driving as well – principally congestion – then they are too low: the marginal external cost of congestion in 2015 was 13.2p/km (in today's prices), double the average fuel duties (plus VAT on fuel duties) paid per kilometre.

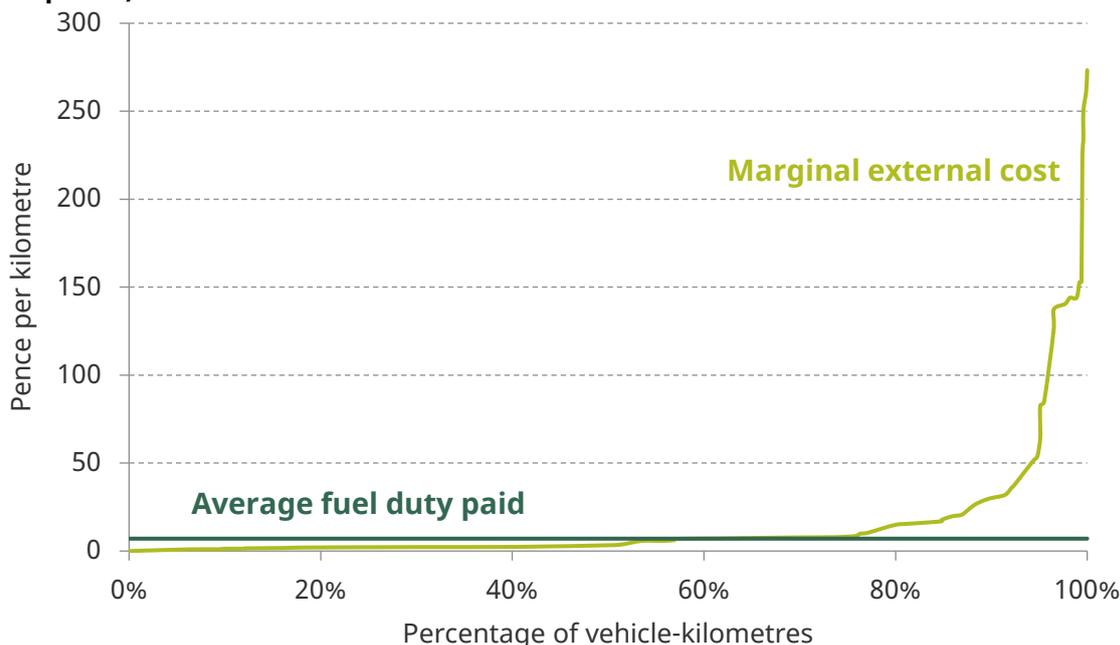
More importantly, fuel duties are not well-suited to correcting for these types of costs. While the social costs of congestion, accidents and noise vary greatly with both the time and location of a journey, fuel duties do not. As such, those driving on congested routes will face fuel duty costs that are far too low relative to the external cost of their journeys, and those driving on empty streets will end up paying far too high a price.

Figure 9.8 shows the approximate distribution of the marginal external costs of motoring in 2015 (incorporating all the sources of externalities listed in Table 9.1). It is worth emphasising that even this approximation understates the true extent of variation in externalities, as it is based on average costs in each of eleven road types and five congestion bands within each type, ignoring potentially large variations by time of day and precise location within those averages. Even ignoring that fine-grained variation, it suggests that over 50% of kilometres driven have external costs of less than 3.5p per kilometre, half as much as the tax these drivers must pay. This difference appears small on the graph only because it is dwarfed by the scale of social harms caused by a relatively small number of journeys: just 10% of kilometres travelled account for over 60% of the external costs, and fuel duties do very little to address those. This highlights the importance of motoring taxes' being able to vary not only with distance travelled but also with time and location. In Section 9.8, we discuss a number of alternative policies for targeting external costs that vary by time and location.

<sup>22</sup> P. Goodwin, J. Dargay and M. Hanly, 'Elasticities of road traffic and fuel consumption with respect to price and income: a review', *Transport Reviews*, 2004, 24, 275–292, [https://www.researchgate.net/publication/32885803\\_Elasticities\\_of\\_Road\\_Traffic\\_and\\_Fuel\\_Consumption\\_with\\_Respect\\_to\\_Price\\_and\\_Income\\_A\\_Review](https://www.researchgate.net/publication/32885803_Elasticities_of_Road_Traffic_and_Fuel_Consumption_with_Respect_to_Price_and_Income_A_Review). This, like most of the other evidence on this subject, is now rather elderly. F. Dunkerley, C. Rohr and A. Daly, *Road Traffic Demand Elasticities: A Rapid Evidence Assessment*, 2014, [https://www.rand.org/pubs/research\\_reports/RR888.html](https://www.rand.org/pubs/research_reports/RR888.html) include what little more recent evidence there is and reaches similar conclusions.

<sup>23</sup> Fuel duties per kilometre calculated based on Department for Transport, 'Road traffic statistics (TRA02)', 14 May 2019, <https://www.gov.uk/government/statistical-data-sets/road-traffic-statistics-tra> and OBR, Public Finances Databank, August 2019, <https://obr.uk/data/>. Distance driven is data for Great Britain, whilst duty receipts are UK total. Receipts per kilometre will therefore be overstated slightly. Both are expressed in 2019–20 prices.

**Figure 9.8. Distribution of total marginal external costs of motoring in 2015 (in 2019–20 prices)**



Source: Authors’ calculations and tables A5.4.1 and A5.4.2 of Department for Transport, WebTAG Databook, May 2019, converted to 2019–20 prices using the GDP deflator. The 2015 marginal external cost distribution is derived using estimates of the total motoring externality for all major types of road (conurbation, urban and rural) across different congestion bands and includes all external costs listed in Table 9.1.

### 9.5 Vehicle excise duty

VED is an annual tax levied on every vehicle registered for road use. It is forecast to raise £6.5 billion in 2019–20. The tax levied depends on the type of car, its emissions and when it was registered, as summarised in Table 9.4. Since 2001, payments have been linked to the fuel efficiency of the car, with the aim of encouraging a shift to more efficient cars, but for new cars registered since April 2017, only the first year’s tax (the ‘showroom tax’) depends on emissions, ranging from zero to £2,135. A higher first-year charge is also levied on diesel cars that do not meet the newest standards for nitrogen oxide emissions (which most existing diesel cars do not meet), while lower first-year rates and a £10 lower annual charge are levied on alternatively fuelled cars; purely electric cars are completely exempt.<sup>24</sup>

There is also an additional annual charge of £320 for vehicles with a list price of more than £40,000, payable for five years from the second year that the vehicle is taxed, which seems an odd and arbitrary way to tax the well-off: it is not clear why we should want to tax specifically those who choose to buy an expensive car rather than those with high income, spending or wealth more generally.

<sup>24</sup> The full set of rates is available at <https://www.gov.uk/vehicle-tax-rate-tables>.

**Table 9.4. Summary of the vehicle excise duty system**

	First year (£)	Second and subsequent years (registered on or after 1 April 2017) <sup>a</sup> (£)	Second and subsequent years (registered before 1 April 2017) <sup>a</sup> (£)
Petrol cars and diesel cars meeting newest standard	0–2,135	145	0–570
Diesel cars not meeting newest standard	0–2,135 (typically higher than for petrol cars and diesel cars meeting newest standards)	145	0–570
Alternatively fuelled cars	0–2,125	135 <sup>b</sup>	0–560 (£10 lower than for petrol and diesel cars)

<sup>a</sup> Additional £320 per year payable for five years (from the second year) if the car's list price exceeds £40,000.

<sup>b</sup> Zero for pure electric cars.

Source: <https://www.gov.uk/vehicle-tax-rate-tables>.

### Does VED accord with economic principles?

VED is a tax on the purchase and ownership of a car rather than its use. As such, it is poorly targeted at the external costs of motoring, which depend on how much, when and where one drives, not on whether one owns a car.

It is hard to see any economic rationale for an annual tax on car ownership. If it depends on the car's emissions, then it can encourage people to buy cleaner cars and scrap dirtier ones; but fuel duties create those incentives too, and have two major advantages over VED:

- they encourage people to drive their cars less;
- the incentive to buy a cleaner car is stronger for those people who are planning to drive more.

This means that, economically speaking, the chancellor should get rid of the annual VED payments entirely and instead raise the equivalent revenue through higher fuel duties. The only justification for retaining an annual VED payment is if, for some reason, the government rules out using fuel duties in its place.

It could be that this is indeed the case; as Section 9.4 shows, the political will even to maintain fuel duties in line with inflation has been consistently lacking over the past eight years, and recent reports that Prime Minister Boris Johnson is contemplating cutting fuel duties by a further 2p per kilometre underline that the direction of travel for fuel duties

seems if anything to be down, not up. If the government deems changes to fuel duties unacceptable but changes to other existing motoring taxes remain possible, then there may be a case for other, second-best forms of environmental taxation on emissions. An annual VED varying by emissions could at least discourage people from owning high-emissions cars, while new taxes such as London's ultra-low emission zone (discussed in Section 9.6) provide some link between driving more often and paying more tax. But while these may be better than nothing, it is important to recognise that they are vastly inferior to using fuel duties to target greenhouse gas emissions.

The first-year VED charge ('showroom tax') is more defensible. Taxing the purchase rather than the use of the car still has these same two disadvantages relative to fuel duties. But there are two arguments that might be made in favour of an emissions-based tax at the point of purchase:

- First, when buying a car, people might pay less attention to the future running costs (including fuel duty) than to the up-front purchase price (including the 'showroom tax'). In principle, an additional £100 of fuel costs (in present-value terms) over the lifetime of the car should influence people's purchase decisions as much as a £100 higher purchase price for a higher-emissions car. But if people do not properly take account of the lower running costs of more efficient cars but do react more strongly to higher up-front costs, then taxing purchases could be a more effective policy to incentivise lower-emissions motoring. The evidence on how individuals weigh up these costs is mixed; on the whole, it suggests that consumers do undervalue future running costs somewhat, but probably not enough to outweigh the two big advantages of fuel duties mentioned above.<sup>25</sup>
- Second, an advantage that VED has over fuel duties is that it allows policymakers to target new purchases, and therefore the characteristics of cars entering the fleet, without directly affecting owners of older cars.<sup>26</sup> This flexibility has most notably been used to encourage a transition from diesel- to petrol-fuelled cars, without penalising drivers who previously purchased diesel vehicles in response to earlier government incentives.<sup>27</sup> In cases such as this, a tax on purchases of new cars may play an important

<sup>25</sup> A 2010 literature review (D. Greene, 2010, *How Consumers Value Fuel Economy: A Literature Review*, US Environmental Protection Agency) found twelve studies that suggest consumers undervalue fuel efficiency, eight that suggest consumers value it roughly correctly and five that find they overvalue it. Two more recent studies look at how effective taxes on fuel are relative to VED-style taxes (A. Alberini and M. Bareit, 'The effect of registration taxes on new car sales and emissions: evidence from Switzerland', *Resource and Energy Economics*, 2019, 56, 96–112, <https://doi.org/10.1016/j.reseneeco.2017.03.005>; L. Grigolon, M. Reynaert and F. Verboven, 'Consumer valuation of fuel costs and tax policy: evidence from the European car market', *American Economic Journal: Economic Policy*, 2018, 10, 193–225, <https://doi.org/10.1257/pol.20160078>). Both find modest undervaluation of fuel efficiency but that taxes on fuel still remain more effective at reducing emissions than emissions-based VED-style taxes.

<sup>26</sup> This is also true of annual VED payments, changes to which can be (and often have been) restricted to cars registered after a certain date. But since the first-year charge can achieve this, there remains no rationale for an annual tax.

<sup>27</sup> Having used motoring taxes to incentivise the purchase of diesel cars for many years because of their lower emissions, the government has recently sought to disincentivise the purchase of such vehicles because of increasing concerns about local air pollutants. It might therefore seem unfair to increase the duty on diesel relative to petrol, since this would penalise those who responded to the government's earlier efforts to incentivise diesel car purchases. So, instead, the government has increased the first-year VED on new diesel cars relative to that on petrol cars.

role, although this suggests a much more restricted role for taxes on purchases than the system we currently have in place.

These arguments suggest that there might be a case for sometimes using an emissions-based tax on new car purchases while abolishing the annual VED charge.<sup>28</sup> But on its own, a tax on new car purchases would not only encourage people to go without a car rather than buying one (part of the point of the policy, with a stronger encouragement to forgo dirtier cars); it would also encourage people to keep their old car rather than replace it with a new one. Consider someone who is contemplating replacing their existing car with a new one; the prospect of a first-year VED charge might put them off replacing the car. With a more environmental focus, we might say that a showroom tax counteracts the incentive that fuel duties provide to replace a dirty old car with a cleaner one.

A solution to that would be to combine an emissions-based showroom tax with a scrappage subsidy that depends on emissions in the same way. For someone replacing an old car with a new car with the same emissions, this would be neutral: the showroom tax would equal the scrappage subsidy, so that a decision with no immediate environmental implications would not be affected by tax. But since the scrappage subsidy would exceed the tax, people with dirty old cars would be encouraged to replace them with cleaner models. And both the showroom tax and the scrappage subsidy would encourage people to have fewer cars in total – respectively, not to buy them in the first place and to scrap those they already have.

## 9.6 London congestion charge and ultra-low emission zone

The London congestion charge was introduced in 2003 and is the main UK example of a tax aimed directly at reducing congestion.<sup>29</sup> It originally consisted of a £5 daily charge that applied to the vast majority of vehicles entering an eight-square-mile zone within central London between 7a.m. and 6:30p.m. on weekdays. Since its introduction, the zone has been expanded to cover a larger 13-square-mile area and the daily charge has been increased to £11.50. In 2018–19, drivers paid a total of £230 million in congestion charges (though it cost £83 million to run the scheme, so net revenue was £147 million).<sup>30</sup>

The charge has been effective at reducing congestion within the zone. Impact assessments carried out by Transport for London (TfL) in each of the four years after the congestion zone's introduction found that it led to an immediate and persistent reduction in congestion of around 20–30%.<sup>31</sup> TfL survey data suggest that over half of the initial reduction in congestion came from people taking public transport instead of driving; around 10–20% from people driving around the charge zone rather than through it;

<sup>28</sup> Note that they do not provide a case for taxing second-hand purchases, as such purchases do not determine which cars are on the road, just who owns them. A tax on second-hand purchases is a classic transaction tax, like stamp duties, which economic theory shows is generally a bad idea: for a given set of cars in circulation, it is inefficient for taxation to discourage mutually beneficial transactions which allocate the cars to those who value them most.

<sup>29</sup> Other smaller schemes include the congestion zone in Durham, which has been in place since 2002, as well as the toll roads on the M6, the Dartford crossing, and a handful of bridges and tunnels across the UK.

<sup>30</sup> Transport for London, *Annual Report and Statement of Accounts 2018/19*, 2019, <https://tfl.gov.uk/corporate/publications-and-reports/annual-report>.

<sup>31</sup> Transport for London, *Central London Congestion Charging: Impacts Monitoring – Fourth Annual Report*, 2006, <http://content.tfl.gov.uk/fourthannualreportfinal.pdf>.

around 10% from people shifting towards untaxed forms of private transport such as bicycle or taxi; and 10% from people stopping travelling within the charging hours or stopping travelling into the zone at all.<sup>32</sup>

Despite some people choosing to divert their journeys around the zone rather than travelling through it, the introduction of the charging zone had only a relatively small effect on the amount of traffic in the surrounding area. The Inner Ring Road acted as the boundary of the zone and was the most obvious route for traffic to avoid the zone, yet it only experienced a 4% increase in traffic in the year following the zone's introduction (with traffic reverting back to around its pre-charge level in the three years following this).<sup>33</sup>

In April this year, London also saw the introduction of a £12.50 daily charge for certain cars entering the ultra-low emission zone (ULEZ), which initially covers the same area as the congestion charge zone but is due to be expanded from October 2021. As the ULEZ is aimed at reducing local air pollution rather than congestion, it applies 24 hours a day, every day of the year, and is payable only on cars that fail to meet certain emissions standards: the Euro 4 standard for petrol cars (which all new petrol cars sold since 2006 are required to meet) and the Euro 6 standard for diesel cars (which all new diesel cars sold since 2015 are required to meet). In practice, therefore, it is mainly a tax on older and more polluting diesel cars.

Although the ULEZ is still very new, preliminary evidence suggests that the policy has been effective at achieving a reduction in the number of older, more polluting vehicles driving into the zone. TfL found that there were 9,400 (26%) fewer vehicles falling short of the relevant emissions standards in the ULEZ on an average day in the first month of its operation than in the previous month, and that around 71% of vehicles in the zone during congestion charging hours met the relevant standards, compared with 61% the month before and 39% in February 2017 when the policy was announced.<sup>34</sup>

The forthcoming expansion of the ULEZ will bring very large numbers of cars into the charge: TfL predicts that in 2021 there would be about 100,000 cars a day entering the expanded zone and not meeting the emissions standards for exemption – or there would be in the absence of the charge.<sup>35</sup> It is likely that the charge will induce many of those affected either to get rid of their old cars (perhaps selling them to people outside London) or not to drive into the zone. As with the congestion charge, the ULEZ charge is expected to raise relatively little revenue, particularly once operating costs are taken into account.

### **Do the congestion charge and the ULEZ accord with economic principles?**

As discussed in Section 9.2, congestion is by far the largest social cost that motoring gives rise to, with the average marginal congestion externality being more than six times that of accidents and 14 times that of greenhouse gas emissions. The benefits of a well-targeted

<sup>32</sup> Transport for London, 'Central London congestion charging scheme: three months on', June 2003, [https://www.eltis.org/sites/default/files/case-studies/documents/3\\_month\\_report\\_5.pdf](https://www.eltis.org/sites/default/files/case-studies/documents/3_month_report_5.pdf).

<sup>33</sup> Transport for London, *Central London Congestion Charging: Impacts Monitoring – Fourth Annual Report*, 2006, <http://content.tfl.gov.uk/fourthannualreportfinal.pdf>.

<sup>34</sup> Comparable figures over time are only available for congestion charging hours. Over the full 24 hours during which the ULEZ operates, 74% met the relevant standards in the first month of the zone's operation. See [https://www.london.gov.uk/sites/default/files/ulez\\_-\\_first\\_month\\_report\\_may\\_19.pdf](https://www.london.gov.uk/sites/default/files/ulez_-_first_month_report_may_19.pdf).

<sup>35</sup> Transport for London, 'Changes to low emission zone and expansion of the ultra low emission zone', 2017, [https://www.london.gov.uk/sites/default/files/appendix\\_c1\\_supporting\\_information\\_document\\_-\\_copy.pdf](https://www.london.gov.uk/sites/default/files/appendix_c1_supporting_information_document_-_copy.pdf).

system that takes these costs into account could therefore be substantial: in the mid 2000s, the Eddington Review of transport policy estimated that a full national system of time- and location-specific road pricing could bring gains in well-being equivalent to up to 1% of national income.

The existing congestion charge falls a long way short of the theoretical ideal. As a flat-rate daily charge, it does not reflect exactly where, when or how much the car is driven in the charging zone – just whether or not it is driven somewhere in the zone at some point during the daytime, Monday to Friday. Nevertheless, it is much better than nothing. As we saw in Table 9.2, the congestion externality per kilometre driven in London is five times the national average and almost 30 times the average in rural areas, so discouraging driving in London is a good place to start. And, as shown in Figure 9.9, the charge covers the most congested periods of the week in London (although it should arguably be extended to include the midday–early-afternoon period during weekends). It has succeeded in reducing congestion. Crude though it is, the congestion charge has been described as ‘a triumph of economics [which] represents a high-profile public and political

**Figure 9.9. Percentage increase in time spent in traffic relative to free flow conditions in London**

	Sun	Mon	Tue	Wed	Thu	Fri	Sat
0:00 – 1:00	17	6	5	7	8	12	16
1:00 – 2:00	12	4	1	2	3	6	11
2:00 – 3:00	8	2	0	0	1	3	7
3:00 – 4:00	6	1	0	0	0	1	4
4:00 – 5:00	2	0	0	0	0	0	1
5:00 – 6:00	0	2	2	2	2	1	0
6:00 – 7:00	1	23	23	23	22	17	2
7:00 – 8:00	3	52	54	54	51	39	7
8:00 – 9:00	6	63	67	67	64	49	13
9:00 – 10:00	12	44	48	49	47	39	22
10:00 – 11:00	20	35	38	39	40	37	32
11:00 – 12:00	30	35	36	38	39	41	41
12:00 – 13:00	39	36	37	39	41	45	47
13:00 – 14:00	40	34	36	38	40	45	48
14:00 – 15:00	37	35	38	40	42	50	44
15:00 – 16:00	34	43	48	51	53	61	39
16:00 – 17:00	34	49	57	60	62	67	37
17:00 – 18:00	36	55	66	69	70	67	39
18:00 – 19:00	34	45	55	58	59	56	38
19:00 – 20:00	28	28	34	36	39	40	33
20:00 – 21:00	21	18	21	23	25	28	26
21:00 – 22:00	15	15	17	19	20	22	22
22:00 – 23:00	13	14	17	19	21	22	22
23:00 – 0:00	10	10	13	15	18	21	22

Note: Relates to all of London, not just the congestion charge zone. Boxed area indicates times when the congestion charge is levied.

Source: TomTom Traffic Index.

recognition of congestion as a distorting externality and of road pricing as an appropriate policy response'.<sup>36</sup>

Although the ULEZ is aimed at reducing air pollution, it will also further reduce congestion: after all, whatever the name and the stated intention, it is another tax on driving in London. Similarly, by discouraging driving in London, the congestion charge acts to reduce local air pollution as well as congestion. But while complementary, these policies are by design targeted at different aims: the congestion charge is better targeted at congestion (varying at least somewhat by time and day) while the ULEZ, being restricted to dirtier cars, is better targeted at air pollution.

## 9.7 Company car tax

So far, we have discussed taxes specific to motoring: fuel duties, vehicle excise duty, and the London congestion charge and ultra-low emission zone charge.

But cars and fuel also feature in all the UK's main taxes: income tax, National Insurance contributions (NICs), VAT and corporation tax. The tax treatment of cars gets complicated because cars can be bought (or leased) by companies or individuals and used for both business and leisure purposes. The tax system needs to ensure that the cost of using cars for business purposes is tax-deductible (like other business costs) while the purchase or provision of cars for private use is taxable (like other personal income/consumption) – a particularly difficult challenge when the same car might be used for a mixture of purposes.

As a result, all of the UK's main taxes have special provisions that apply to cars and fuel. We do not discuss in this chapter all the details of – and flaws in – those provisions. Suffice it to say that successive governments have made an inevitably difficult issue much worse than it needs to be. Here we focus on just one key part of that system: the income tax and NICs levied on cars owned or leased by a company but provided for employees' private use. This is an important part of the system of motoring taxes: while the provision of company cars has been in long-term decline, there are still almost a million employees paying tax on a company car each year, and the income tax and NICs on these came to £2.3 billion in 2017–18 – about £2,500 per company car user.<sup>37</sup>

Providing a car for an employee's private use is a form of remuneration and should be taxed as such. In practice, the provision of company cars, like many other benefits in kind, is subject to income tax and employer NICs but not to employee NICs. This employee NICs exemption reduces the tax rate on company cars by 12 percentage points for the half of recipients earning less than the NICs upper earnings limit (currently equivalent to £50,000 a year) but by only 2 percentage points for those earning more than that. There is no good justification for this exemption: remuneration should be subject to the same taxes, at the same rates, whether provided in cash or in kind.

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<sup>36</sup> J. Leape, 'The London congestion charge', *Journal of Economic Perspectives*, 2006, 20(4), 157–76, <https://www.jstor.org/stable/30033688>.

<sup>37</sup> This excludes the (rather high) tax on employer-provided fuel, which we do not discuss here. Source: Table 4.5 of HMRC statistics, <https://www.gov.uk/government/statistics/number-of-recipients-and-amounts-of-taxable-benefits-by-type-of-benefit>.

But perhaps more interesting is how the government calculates the value of the remuneration that is to be taxed. Rather than estimating the value to the employee (or the market value) of receiving the use of the car for a year, the government sets the taxable amount as a percentage of the car's list price, with the percentage varying with the car's emissions and fuel type (it currently ranges from 16% for the cleanest cars to 37% for the dirtiest).

Those percentages have been increased over time to maintain revenue as cars have become more fuel-efficient. But, in recent years, tax rates have been increased more quickly, with the deemed taxable value of most company cars increasing by 13% of the list price over the past six years. For cars emitting less than 95gCO<sub>2</sub>/km, that more than doubles the tax. This increase is much faster than the rate at which the company car fleet has been getting more fuel-efficient, so the average tax liability on company cars rose by almost a quarter in real terms between 2013–14 and 2017–18 (from £2,150 to £2,630 in today's prices) and will have increased still more in the past two years as the rise in tax rates has accelerated.

The recent history of company car tax policy for electric vehicles is even more remarkable. The tax on the provision of a pure electric car has increased gradually from zero before 2015 to 16% of the list price this year, but will fall back to zero next April and then rise again to 1% in 2021–22 and 2% in 2022–23. Such wild swings cannot be conducive to good planning by the suppliers and buyers of company cars.

### Does company car tax accord with economic principles?

Taxing company cars according to their emissions is superficially appealing: it is another way the government can promote a shift away from damaging high-emissions driving. It is tempting to think that every weapon in the armoury should be employed to pursue this goal. But in fact almost the opposite is true. Rather than asking how every policy tool can be used to achieve a particular goal, policymakers should ask which tool is best suited to achieving the objective, and concentrate on that. As the Mirrlees Review of the tax system emphasised, 'not all taxes need to address all objectives. Not every tax needs to be "greened" to tackle climate change as long as the system as a whole does so'.<sup>38</sup>

What matters is the effect of the system as a whole. The best way to strengthen environmental incentives is to make more use of the best-targeted policies. Adding different, less well-targeted, policies into the mix instead means that the aim of reducing emissions will not be achieved as efficiently, increasing the cost of meeting the objective – and complicating the tax system in the process.

Company car taxation is not the best-targeted policy available for reducing car emissions. As with VED, the current system of company car taxation encourages people to choose cleaner cars but does nothing to encourage them to drive their cars less. Fuel duties do both. Furthermore, company car taxation is even less well targeted than VED precisely because the incentives it creates are restricted to company cars. Making company car taxation depend on the emissions of the car (rather than, say, increasing fuel duties or strengthening the link between VED and emissions for *all* cars) means that we are incentivising 'green' choices in respect of company cars more than for other cars.

<sup>38</sup> Page 472 of J. Mirrlees et al., *Tax by Design: The Mirrlees Review*, 2011, <https://www.ifs.org.uk/publications/5353>.

A tax regime that is more strongly emissions-based for company cars than for other cars means that those buying company cars will choose cleaner models even if they are much less desirable than dirtier cars, whereas for other car-buyers, the dirty car need have only relatively small advantages to outweigh the tax penalty for buying it. If the environmental incentives were evened out between the two groups, similar environmental outcomes could be achieved while, on average, people would have cheaper, better cars.

Taxation can and should make cars, especially dirty cars, more expensive to buy and run so that everyone uses them less. But beyond that, whether people use their own cars for work or the firm provides one, and whether firms reward their staff in cash or by providing them with a car, should be private, commercial decisions. A company's purchase of a car for an employee's exclusive private use should be treated the same as if the company paid her the amount in cash and she bought the car herself. Under the system now in place, if people want a cleaner car then the company should provide it, whereas if it is a dirtier car then they should buy it themselves. That is a bizarre incentive for the tax system to create.

Arguments sometimes made for emissions-based company car taxation are similar to those for the emissions-based first-year VED: that, since company cars are disproportionately new cars, changing how they are taxed provides a quick way to influence the characteristics of new cars entering the UK market (and therefore the stock of cars on the road). But in that respect the first-year VED is better targeted than company car taxation: it is precisely targeting the inflow of all new cars, rather than cars that merely happen to be newer than average, and it applies regardless of who buys the vehicle. Similarly, to the extent that targeting new cars is effective because people pay too little attention to future running costs when buying a car, a VED charge at point of purchase should be more effective than annual company car taxation. Given the availability of an emissions-based showroom tax, it is hard to see a role for emissions-based company car taxation.

Income tax and NICs should be levied, at the taxpayer's marginal rate, on the value to the employee of having the use of the car for a year. That is, they should be applied to the amount it would cost the employee to lease the car for a year – which will depend on the car's emissions only in so far as the car's rental price reflects its fuel efficiency (and the tax should reflect the car's age, for example, in the same way). At present, a typical company car (a 100gCO<sub>2</sub>/km diesel) will be taxed on 28% of its list price, which is higher than this benchmark suggests: the employee would be taxed on the full value of the car over four years, hardly its full lifetime. But that high taxable *value* is somewhat offset by a reduced tax *rate* on that value, resulting from the employee NICs exemption. Whether a company car is overtaxed or undertaxed in any particular case will therefore depend on the car's emissions and on whether the recipient earns more or less than the upper earnings limit.

## 9.8 Motoring forward: making policy for the future

The government's commitment to reaching zero net emissions by 2050 means that, over the next few decades, the money that it raises from fuel duties and any taxes linked to emissions (which is almost all of the revenue currently raised from motoring taxes) will all but disappear.

This is a long-run fiscal challenge for the government. It is also an economic and social challenge: since the other external costs of motoring, particularly congestion, will not disappear, alternative taxes on motoring will be needed to help reflect these costs in the prices that drivers pay. As discussed in Sections 9.4–9.7, current motoring taxes are not effectively designed to do this. The need to rethink motoring taxation in light of declining revenue from fuel duties provides an opportunity to design better-targeted taxes that overcome some of the limitations set out in this chapter.

The change needs to start now, before existing taxes are eroded to the point that we have virtually no taxes on motoring at all. And it needs to start from a clear plan for the long term, albeit one that is flexible enough to cope with the unpredictable future of motoring.

### How should motoring taxes be structured in the long run?

Motoring taxes should be designed to incorporate the social costs of motoring – congestion, emissions, noise and so on – into the prices paid by motorists. Different social costs require different kinds of taxes; while emissions are best targeted with fuel duties, targeting congestion requires taxes that vary by time and place.

As the UK transitions towards low-emissions motoring, taxes targeted at emissions will become a less important part of the overall system of correcting for the social costs of motoring. That does not mean that policymakers can ignore them now; while there are still conventionally fuelled cars on the road, fuel duties will remain the best tool to target these costs. And going forward, policymakers should think about some of the indirect environmental costs of alternatively fuelled cars – for example, from generating the electricity to power them. These are not small concerns: the National Infrastructure Commission estimates that a 100% uptake of electric cars and vans could increase total annual electricity demand by 26% by 2050,<sup>39</sup> so a broader set of policies to support the ongoing transition to low-emissions electricity generation will be essential for these alternatively fuelled vehicles to fulfil their environmental potential.

But when it comes to the future of taxes on motoring specifically, the biggest challenge will be to design a long-term policy framework that can correct for motoring’s external costs. We have seen that by far the biggest of these costs is congestion, and – notwithstanding the advent of autonomous vehicles – that is likely to be increasingly true in a future with lower-emissions motoring. It is therefore important that motoring taxes be designed to reflect the costs of congestion, which in turn means they should vary according to when and where someone is driving.

The theoretically ideal way of targeting the costs of congestion is a flexible system of road pricing, where the charges people face vary substantially with the time and location of their journey. Such systems are technologically feasible and exist already – with the first full-scale system introduced in Singapore in 1998. The technology used there is relatively simple: vehicles are required to contain an ‘in-vehicle unit’ which can be detected by Radio Frequency Identification (RFID)<sup>40</sup> when they pass under gantries that are located along the most congested routes, along with a pre-paid card from which payment is deducted. Predetermined fees vary by route and time of travel and cars are charged each time they

<sup>39</sup> Page 57 of National Infrastructure Commission, *National Infrastructure Assessment July 2018*, <https://www.nic.org.uk/publications/national-infrastructure-assessment-2018/>.

<sup>40</sup> <https://www.mot.gov.sg/about-mot/land-transport/motoring/erp>.

pass under a gantry; the charges range from zero to the equivalent of £3.50 and are frequently reviewed and updated.<sup>41</sup>

Short of a fully fledged system of variable road pricing, countries and cities around the world have developed and implemented less intensive road pricing systems that still do a fairly good job of capturing the costs of congestion. As discussed in Section 9.6, the London congestion charge is one such example, although it remains a relatively blunt instrument, applying to one city and levied at a flat daily rate. There are large potential gains to be had from both applying similar schemes to other congested routes or areas elsewhere in the UK – with Birmingham, Glasgow, Manchester and Bristol topping the list of congested cities outside London in 2018<sup>42</sup> – and developing a more nuanced system that allows charges to approximate the costs of congestion more precisely.

More nuanced systems that remain less invasive than a comprehensive system have been applied elsewhere internationally. Stockholm uses a system that charges vehicles each time they enter different zones. The charges depend on the time of day, ranging from no charge (between 6:30p.m. and 6:30a.m.) to 35 SEK (around £2.90). The maximum daily charge is capped at 105 SEK (£8.70).<sup>43</sup> Oslo, Bergen and Gothenburg have also implemented systems where the price drivers pay depends on where and when they are driving, and Jakarta is planning on introducing a similar scheme next year.

### Challenges to taxing congestion

Although technologically road pricing looks much more feasible now than when it was discussed 10 or 20 years ago, that does not mean it is politically acceptable. One objection is that some systems would involve the collection of extensive information on the location of vehicles across all times of day (and storing the resulting data for at least a while), raising concerns among some about invasion of privacy. But even simpler approaches face political challenges. Although congestion charging was successfully introduced in London, referendums in 2005 in Edinburgh and 2008 in Manchester rejected it, with 74% and 79% respectively of votes cast against it.<sup>44</sup> In addition to concerns about privacy, some of this unpopularity may be due to the fact that residents did not have a clear idea of the likely reductions in congestion that the schemes would achieve. The Stockholm congestion zone was initially met with a great deal of opposition and therefore first introduced as a seven-month trial. After the trial, residents chose in a referendum to make the scheme permanent.<sup>45</sup> This reversal of public opinion suggests that people underestimated the benefits of the scheme. A similar argument could be made in London, where the then mayor Ken Livingstone was re-elected after having introduced the London congestion charge.

A further objection is that congestion charging is unfair on those who have less choice over whether they drive through a congested area at a particular time. But a similar argument could be made that fuel duties unfairly penalise those living in rural areas

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<sup>41</sup> <https://blog.moneysmart.sg/transportation/erp-rates-gantry-singapore/>.

<sup>42</sup> INRIX Global Traffic Scorecard 2018 (see <http://inrix.com/press-releases/scorecard-2018-uk/>).

<sup>43</sup> <https://www.transportstyrelsen.se/en/road/Congestion-taxes-in-Stockholm-and-Goteborg/>.

<sup>44</sup> L. Butcher, 'Local road charges', House of Commons Library Briefing Paper SN01171, 2018, <https://researchbriefings.parliament.uk/ResearchBriefing/Summary/SN01171#fullreport>.

<sup>45</sup> J. Eliasson, 'The Stockholm congestion charges: an overview', Centre for Transport Studies Working Paper 2014:7, [https://swopec.hhs.se/ctswps/abs/ctswps2014\\_007.htm](https://swopec.hhs.se/ctswps/abs/ctswps2014_007.htm).

poorly served by public transport, who may have little choice but to drive: they would benefit from a shift away from fuel duties towards road pricing. Furthermore, unlike with fuel duties, those who have no choice but to drive through a congested area are the same people who would benefit from the reductions in congestion that would follow from the introduction of road pricing.

The proposals in both Edinburgh and Manchester were for congestion charging in addition to existing taxes. One possible way for the government to make the idea of road pricing more politically palatable is to propose it as a *replacement* for most of fuel duties, rather than levied in addition.<sup>46</sup> This would certainly not be cost-neutral for individual households: those driving long distances in rural areas would gain while those making short journeys in congested areas would lose. But while some people (particularly drivers in congested cities) would pay substantially more, there would be many more winners than losers. And if it were revenue-neutral at the point the reform happened, it might at least not be seen simply as an excuse to raise taxes. Politics aside, it makes sense at the moment on economic and environmental grounds: as we saw in Section 9.4, fuel duties are currently too high to justify by emissions alone if there are other policies targeted at congestion. But it is an offer viable only while there are still fuel duties being collected.

### Other options for replacing fuel duties

If the government wishes to continue taxing motoring as petrol and diesel are phased out, but rejects road pricing for whatever reason, a number of alternatives are available:

- One would be to place more reliance on taxes on car purchase or ownership such as VED. But such taxes do nothing to encourage people to drive their cars less once they have them.
- Another option would be to apply duties to alternative fuels, such as electricity and hydrogen, much as fuel duties apply to petrol and diesel now. Unlike VED, that would impose a higher tax on heavier car usage. But it would require the ability to enforce a higher tax rate on electricity used for a car than on other electricity, which might be challenging if people charge their cars at home, for example.
- Perhaps the most promising alternative to road pricing is a simple per-mile charge, an idea proposed and developed most fully by Raccuja (2017).<sup>47</sup> This would raise revenue in a very similar way to fuel duties (as distance travelled is closely related to fuel consumption) but would continue to be viable as cars move away from using fossil fuels.

If the aim is simply to sustain motoring tax revenues as fuel duties disappear, this last option is an appealing one. But all of these options share the inadequacy of fuel duties in that they would be very poorly targeted at congestion which, as we have seen, is overwhelmingly created by a relatively small subset of journeys. Raccuja suggests that drivers could be given the choice between ‘no tech, high privacy’ (self-declared mileage, which is already collected by insurance companies) and ‘high tech, low privacy’ (telematics

<sup>46</sup> This was the recommendation of the IFS-led 2011 Mirrlees Review of taxation: J. Mirrlees et al., *Tax by Design: The Mirrlees Review*, 2011, <https://www.ifs.org.uk/publications/5353>.

<sup>47</sup> G. Raccuja, ‘Miles better’, Wolfson Economics Prize winner, 2017, <https://policyexchange.org.uk/wolfson-winner/>.

'black box' in the car that tracks when and where you drive) options, and argues that the greater convenience and automation that come with the telematics option would probably lead to large-scale movement to that option. If that is true, it would therefore be a good intermediate option en route to a comprehensive system of road pricing, which could use this same technology. Once telematics were prevalent in cars, it would be easy to adapt this technology to vary the charge by time and place of driving – though Raccuja himself opposes actually doing that because of the perceived unfairness of variable road pricing.

### **Managing the transition to low-emissions cars**

An eventual move to low-emissions motoring now looks all but inevitable, almost irrespective of the details of UK policy. Car production is a highly internationalised industry. When car makers have stopped designing and manufacturing conventionally fuelled cars for the global market and make cleaner ones instead, those cleaner models will form the base of the UK market too.

But that shift will happen gradually: for several decades, there will be a mixture of conventionally and alternatively fuelled cars available on the market, and UK government policy can have a major influence on how quickly the transition happens here. The government has committed to ending the sale of new petrol and diesel cars by 2040, but that is still 20 years away. In the intervening period, policies on motoring are likely to be crucial in determining whether the UK is in the vanguard or the rearguard of the global shift to low-emissions cars. Given that 15% of the UK's total greenhouse gas emissions comes from road transport (and that share is rising), the speed of this transition has big implications for the UK's cumulative emissions output.

The government faces a difficult trade-off. In the long run, low-emissions motoring should be taxed, to maintain some disincentive to socially costly motoring (and some revenue) when all cars have low emissions. Yet in the short run, the government may want to encourage the shift towards low-emissions vehicles, and keeping taxes low on low-emissions vehicles is an obvious way to do that.

Raising tax rates on low-emissions motoring – or introducing entirely new taxes once existing ones have withered – is likely to become increasingly politically difficult as more and more people have low-emissions cars. The government needs to decide both what it wants the long-run tax regime for motoring to look like and how it will manage the transition to that point. The challenge is to get this transition right: encouraging the shift to low-emissions motoring without embedding the expectation that it will always be taxed at low levels (or hardly at all).

One possibility is to start taxing low-emissions motoring now (in one of the ways discussed above, or another) but combine that with short-run measures to encourage low-emissions motoring that could more easily be removed in the future. In other words, rather than encouraging the shift to low-emissions cars by leaving them largely untaxed, and then trying to introduce significant taxes on them later, the government could bring in a sensible long-run tax regime for them now (while they still represent a small minority and expectations are not entrenched) and instead encourage the shift to low-emissions cars through other policies that are inherently short-term in nature or which might be easier to remove than a new tax would be to introduce.

What might such short-term policies be?

One option is to offer a temporary subsidy for the purchase of low-emissions cars. The government already does this: since 2011, it has offered a plug-in car grant which provides a discount of 35% of the purchase price of low-emissions vehicles, initially up to a maximum of £4,500 for pure electric cars and £2,500 for hybrids.<sup>48</sup> The grant is explicitly temporary, as Transport Secretary Grant Shapps advised last month: 'If you are ... thinking of buying an electric car, buy it while the subsidy's there, because it will go eventually'.<sup>49</sup> This is a reminder that the prospect of removal of a subsidy can also help to accelerate the transition to low-emissions cars; indeed, when the subsidy on hybrids was removed in November 2018 – surprisingly early – sales of plug-in hybrids subsequently fell sharply.<sup>50</sup>

Although a typical electric car is about £10,000 more expensive than a typical conventionally fuelled car, these purchase subsidies can make a difference: a number of studies have found that, together with the lower running costs of electric vehicles, the subsidies bring down the total cost of an electric car over its lifetime to less than that of a conventionally fuelled car.<sup>51</sup>

However, there might be people who would benefit financially in the long run with an electric car but lack the up-front cash to buy one. Motivated by this, the Labour party proposed its own temporary subsidy for electric cars at its party conference last month, announcing that for five years it would provide interest-free loans of up to £33,000 to up to 500,000 people a year to buy new electric cars.<sup>52</sup> It is not clear why the subsidy should take the form of a zero interest rate (and therefore vary in generosity as interest rates change), why the government should provide loans for car purchases but not other things and why Labour has decided that the eligible population should comprise low- and middle-income households, those living in rural areas, and independent contractors and small businesses. Indeed, one difficulty with targeting subsidised loans is that the people (and cars) for whom loans are appropriate and those for whom subsidies are appropriate are not necessarily the same. But the scheme (and the prospect of its removal) would certainly help to speed up the adoption of electric cars.

Similarly, a shift to cleaner cars could be incentivised by subsidising scrappage of dirty old ones – a policy with a naturally limited lifespan as old conventionally fuelled cars gradually disappear from the road. As part of its package of measures to promote electric cars, Labour also proposed a one-year scrappage scheme that would provide a subsidy for

<sup>48</sup> Since November 2018, the subsidy for pure electric cars has been capped at £3,500 and the subsidy for hybrid cars removed entirely.

<sup>49</sup> '£3,500 electric car grant will run dry, says the transport secretary, Grant Shapps', *The Sunday Times*, 8 September 2019, <https://www.thetimes.co.uk/article/electric-car-grant-will-fizzle-out-bfq8b6ppp#>.

<sup>50</sup> See <https://www.gov.uk/government/news/reformed-plug-in-car-grant-extended-into-next-decade> for the government's announcement and <https://www.ft.com/content/e58b168c-70a4-11e9-bbfb-5c68069fbd15> for the aftermath.

<sup>51</sup> K. Palmer, J. Tate, Z. Wadud and J. Nellthorp, 'Total cost of ownership and market share for hybrid and electric vehicles in the UK, US and Japan', *Applied Energy*, 2018, 209, 108–19, <https://doi.org/10.1016/j.apenergy.2017.10.089> compare the Ford Focus and Nissan Leaf Electric Car. International Council on Clean Transportation, *Using Vehicle Taxation Policy to Lower Transport Emissions*, 2018, <https://theicct.org/publications/using-vehicle-taxation-policy-lower-transport-emissions> carries out a comparison of different models of the Volkswagen Golf, which offers electric, hybrid, petrol and diesel versions.

<sup>52</sup> <https://labour.org.uk/press/john-mcdonnell-announces-interest-free-loans-electric-cars/>. A similar loan scheme already operates in Scotland: see <http://www.greenerscotland.org/greener-travel/greener-driving/grants-and-funding>.

drivers who scrapped a conventionally fuelled car that was at least 10 years old and bought a new electric one instead.<sup>53</sup>

Along with temporary subsidies for buying clean new cars or scrapping dirty old ones, another way the government could encourage the adoption of low-emissions cars (while avoiding tax-free treatment that risks becoming permanent) is to fund the infrastructure that makes them useful. Indeed, this is arguably where the case for government intervention is strongest: infrastructure such as charging points requires a coordinated system and is exactly the kind of public good that the market might underprovide as the reward to any individual actor might not make it worthwhile even if the shared benefits are large. The UK's first ever National Infrastructure Assessment, delivered last year, emphasised the value of public investment in this area.<sup>54</sup> And such support will naturally tend to be front-loaded while the infrastructure is built up. In *The Road to Zero*, the government announced a number of policies committing to improving the availability of charging infrastructure for electric vehicles.<sup>55</sup> And again, Labour's raft of proposals included a £3.6 billion investment to expand charging networks between now and 2030.<sup>56</sup>

A recent survey by OVO Energy found that the main barriers to electric vehicles' becoming widespread were their high purchase price, lack of available charging infrastructure and concern about how long a given charge will last ('range anxiety').<sup>57</sup> Purchase subsidies could help to address the first of these, and investment in infrastructure the other two (which are related as the availability of local charging infrastructure is likely to alleviate range anxiety). Such temporary policies could help to support the transition to low-emissions cars even as a sustainable long-term approach to taxing them is put in place from (almost) the outset. The government might prefer an alternative approach. But it needs a plan of some sort if it wants to promote low-emissions vehicles in the short run but tax them in the long run. And it needs to move quickly.

### Speed is of the essence

Whatever system of motoring taxation the government envisages for the long term – be that a system of road pricing or blunter instruments such as an increased tax on car ownership – it is important that swift action is taken. Politically, it will be much easier to introduce alternative motoring taxes if that can be set against big cuts to fuel duties (which are destined to disappear anyway over the coming decades) and before the expectation of untaxed motoring becomes ingrained. Moreover, if the new system requires infrastructure to be put in place (a system of road pricing, for example), that is likely to take time.

<sup>53</sup> <https://labour.org.uk/press/electric-car-revolution-labour-launch-car-scrappage-scheme-help-drivers-go-electric/>.

<sup>54</sup> National Infrastructure Commission, *National Infrastructure Assessment July 2018*, <https://www.nic.org.uk/publications/national-infrastructure-assessment-2018/>.

<sup>55</sup> <https://www.gov.uk/government/publications/reducing-emissions-from-road-transport-road-to-zero-strategy>. These included ensuring new-build homes include charging points and installing charging infrastructure in new lamp posts in areas with on-road parking, as well as putting aside £40 million for a programme to develop new low-cost wireless and on-street charging technology. If wireless charging were successfully introduced, this would also address range anxiety as charging could take place while driving.

<sup>56</sup> <https://labour.org.uk/press/labour-announces-mammoth-expansion-uks-electric-vehicle-charging-networks/>.

<sup>57</sup> OVO Energy, 'What's stopping the "electric vehicle revolution"?', 2017, <https://www.ovoenery.com/blog/ovo-news/whats-stopping-the-electric-vehicle-revolution.html>.

## 9.9 Conclusion

The UK's existing taxes on motoring are badly designed and should be improved.

Vehicle excise duty is a strange levy, taxing the purchase and ownership of cars rather than their use. There is some case for a first-year VED charge ('showroom tax'), ideally combined with a scrappage subsidy that depends on emissions in the same way. These might influence people's car purchase, replacement and scrappage decisions more effectively than taxes that affect cars' running costs, and allow the government to change incentives for future purchases without affecting existing car owners as much. In contrast, there is no case for keeping an annual VED charge if the revenue can be raised from fuel duties instead.

The arguments against emissions-based company car taxation are even stronger, since these taxes are also based on ownership rather than how much the cars are driven but are further restricted to only apply to the subset of cars that are bought by companies and made available for their employees' private use. Rather than try to achieve its environmental goals through the company car tax system, the government should simply tax the value of the car to the employee.

Fuel duties are the best-targeted way to reduce emissions from motoring, since they encourage people to drive their cars less and provide a stronger disincentive to buy high-emissions cars for people who plan to use them a lot. Despite significant real-terms reductions in recent years, UK fuel duties are high by international standards, too high to be justified by motoring emissions, and widely perceived as unfair – though they are too low to reflect the overall costs (principally congestion) that driving imposes on others.

Policymaking on fuel duty in recent years has been a mess. Whether fuel duties should be higher or lower, the government should stop the ad hoc but repeated cancellation of regular fuel duty uprating, perhaps aided by moving from annual to monthly uprating and certainly linked to the CPI measure of inflation rather than the RPI.

If the government finds it politically impossible even to maintain fuel duty rates in line with inflation, then making more use of emissions-based VED is probably the best of the alternatives currently in use. But to tackle the harm that driving does, now and in the future, the government should look beyond the existing set of taxes.

Ideally, the cornerstone of motoring taxation should be a system of road pricing, varying by time and place to reflect congestion levels. Failing that – or, better, as a stepping stone towards road pricing – the government could introduce a tax per kilometre driven. Like fuel duties, this would provide an incentive to drive less, but it could be applied equally to alternatively fuelled cars, helping to shore up revenues and maintain some disincentive to drive as conventionally fuelled cars are phased out.

However, it is important to recognise how inferior this is to a system of road pricing that varies by time and place. Congestion is by far the biggest social cost of driving and it varies enormously by time and place, with most of the congestion caused by only a small fraction of journeys. Only a tax that varies by time and place in the same way can reap the huge rewards potentially available in terms of freeing up people's time. While technology

is becoming less of a barrier to such a system, challenges remain – particularly in reconciling the need to collect data on driving routes with concerns about privacy.

Any changes along these lines would be politically challenging. But the status quo is not sustainable. Fuel duties are gradually shrinking as a share of national income and will disappear altogether in the coming decades as petrol and diesel cars become more fuel-efficient and are ultimately replaced by alternatively fuelled vehicles. The government needs a plan for how it wants to tax motoring when cars are no longer powered by fossil fuels, and it needs a plan for how to get from the current system to that long-run goal. The desire to encourage a shift to low-emissions cars makes it tempting to levy low or no taxes on them. But the longer that goes on, the more revenue will be eroded and the more entrenched expectations of low taxes on motoring will become, making it ever harder to start taxing low-emissions motoring in whatever way the government ultimately wants to. Managing that trade-off is the core long-term challenge for motoring tax policy.

In our view, the most promising approach would be to move quickly towards a significant tax that can apply long term to low-emissions vehicles as well as conventionally fuelled cars – probably a flat-rate tax per kilometre in the first instance, with a view to varying the tax rate by time and place later on. This tax should be introduced in exchange for large reductions in petrol and diesel duties, which are well targeted at emissions but far too high to justify by emissions alone – a quid pro quo that is only available while people are still buying large amounts of petrol and diesel. Switching to low-emissions cars should be encouraged via subsidies for buying clean new cars and scrapping dirty old ones, and via investment in infrastructure such as charging points that makes alternatively fuelled vehicles a more attractive proposition. Such policies will tend to wither away naturally as alternatively fuelled cars become the norm – or at least it might be easier to remove them at that stage than to introduce new (or much higher) taxes on alternatively fuelled cars once most people already have them.

The government might prefer a different approach. But whatever view it takes, it needs a plan both for the long term and for how to get there. So far, the government has not said how it thinks low-emissions driving should be taxed in the long term – or whether it is content to see motoring tax revenues dry up and virtually no tax at all levied on motoring and the harms it causes. New systems can take time to set up and there is a premium on acting quickly, while fuel duties are still raising significant revenue and before lightly taxed low-emissions cars make up a substantial share of the fleet. Given the speed at which the nature of driving is evolving – and must evolve – the government needs to start now. Burying its head in the sand is not a good option.