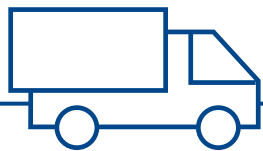


# Charging for Road Use White Paper

What is the future of mobility pricing?



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## About this report

This White Paper has been produced by the Chartered Institution of Highways and Transportation (CIHT) with support from Bentley Systems.

It is based on a literature review, practitioner interviews, and an expert roundtable held at CIHT HQ in London in November 2023.

**Part 1** - presents our high-level conclusions and calls on colleagues across the transportation profession and beyond to collaborate on new ideas for tackling shared questions that can help unlock the power of charging for road use as part of the transport professional toolbox.

**Part 2** - presents highlights from our supporting evidence. This material provides insight on recent international developments in the field of charging for road use and summarises the consensus position emerging from a series of recent publications from UK think tanks and research organisations.

## Executive summary

Asking drivers to pay directly for their use of roads is back on the agenda. In the UK, a series of recent reports from Parliament's Transport Select Committee and a range of think tanks and research organisations have all advocated for a national pay-as-you-drive system to eventually replace Fuel Duty. In Europe, charging HGVs to use the road network is increasingly the norm, while many US states are developing schemes for charging electric vehicle (EV) users.

This is not a new debate. Charging drivers for using roads is a hardy perennial of transport policy. Its proponents have a variety of motives. National and local governments both eye a potential source of revenue from various forms of tolls for road use. Economists and transport professionals see a broader set of charges as a tool for securing policy objectives such as managing scarce road space, alleviating congestion, and reducing pollution.

Paying to use roads is however an idea that has struggled to win wide acceptance in the UK. The public have been suspicious that they are being subjected to stealth taxes or that drivers are being punished for making journeys that are unavoidable. The technology that supports charging has also generated concerns around privacy and data security. Against that backdrop, the sponsors of new schemes have often found it difficult to address these concerns while also explaining the positive benefits they intend to deliver to drivers and the wider community.

Charging for road use is not synonymous with the kind of large-scale pay-as-you-drive schemes being promoted as a replacement for Fuel Duty. Congestion charges, low-emission zones, and charges for specific types of vehicles can all form part of the toolbox used by professionals to tackle transport problems, sitting alongside other tools such as investments in public transport land-use policies and behaviour-change initiatives. It is therefore in the interests of the profession and the people whose problems we are trying to solve to ensure that the whole concept is not dismissed as simply too difficult to deliver.

To avoid that depressing outcome, we will need to build our capability to develop proposals for charging that address three interlinked sets of questions.

- ✔ **Policy:** what is the rationale for introducing charges for road use, what problems is it intended to help solve, and what other policies need to be in place to achieve these goals?
- ✔ **Practical:** how will the scheme be designed, under what kind of business model will it operate, what technology options flow from these choices, what data will be needed, and how will it be collected and managed?
- ✔ **Political:** what will make the proposal viable in its specific political and legal context, and what communications and public engagement requirements flow from this analysis?

We are not convinced that the current surge of interest, focused largely on the revenue-raising potential of charging, adequately addresses all three sets of questions. It therefore runs a high risk of fizzling out and taking all forms of charging for road use off the table for a decade or more.

To support this capability-building effort, CIHT wants to bring together a group of stakeholders to develop new thinking on issues that are standing in the way of the full range of charging options being available to help improve the transport system.

To kick-start this discussion, we have created a list of questions that has emerged from our work to date. We would like to refine and prioritise this list in dialogue with colleagues from across the sector.

- ✔ How can we make better use of the enormous volumes of data generated by the circa 40 million vehicles on UK roads to better manage use of road space through charging? How do we overcome privacy concerns, and how can we get stakeholders such as network operators, vehicle manufacturers, and insurers involved in this task?
- ✔ How in the UK's centralised political system can we draw on the USA's state-level experience that buy-in can be generated by introducing opt-in charging schemes that offer drivers a more attractive deal than current taxes?

- ✔ More generally, how can we put user choice of how and when to pay at the centre of future charging schemes?
- ✔ How can we build on the technical infrastructure developed to support low-traffic neighbourhoods, on- and off-street parking management, and other programmes that have shaped how road space is used? What are the political and policy lessons from this work?
- ✔ How can we operationalise the insight from the USA that up to 50% of the budget for successful charging schemes has been spent on communications and stakeholder engagement?
- ✔ How can we improve our understanding of which transport problems create the greatest opportunity to generate public support for moving towards using charging as a tool?
- ✔ How can we ensure that the technology platforms and operating models that support new schemes (a) deliver a good user experience, ideally allowing drivers to pay for multiple services in one place and (b) do not close off opportunities for further development, up to and including a UK-wide pay-per-mile road user charging scheme?
- ✔ How can we (or perhaps who can) develop the digital maps of the UK road networks that we will need to underpin future charging tools?

## Definitions

This paper uses the term charging for road use as an umbrella term to refer to any policy that imposes fees on drivers for their use of roads.

In the UK, most of the time drivers do not pay these kinds of direct charges when they drive from A to B. There are of course some notable exceptions, including a toll road (M6 toll), a small number of toll bridges and tunnels,<sup>1</sup> London's congestion charge and Ultra Low Emission Zone (ULEZ), Durham's Road User Charging Zone, and low-emission zones in Aberdeen, Bath, Birmingham, Bradford, Dundee, Edinburgh, Glasgow, Portsmouth, Sheffield, and Tyneside.

In the broader sense of paying for use of road space, UK drivers are also accustomed to paying for on-street parking in residential areas and urban centres.

In other parts of the world there are long-standing examples of schemes that charge heavy goods vehicles (HGVs) and other classes of vehicles for the distance travelled on roads, alongside newer innovations such as levies on vehicles making deliveries to private homes (sometimes referred to as an "Amazon Tax").

These charges have a variety of objectives including raising revenue to pay for maintaining infrastructure, making more efficient use of road space, limiting the impact of congestion, reducing carbon emissions and noise, and improving air quality. They also rely on a range of technologies from the relatively low-tech, such as permits and odometer readings, through to increasingly sophisticated use of satellite tracking of vehicle movements and automatic number plate recognition systems.

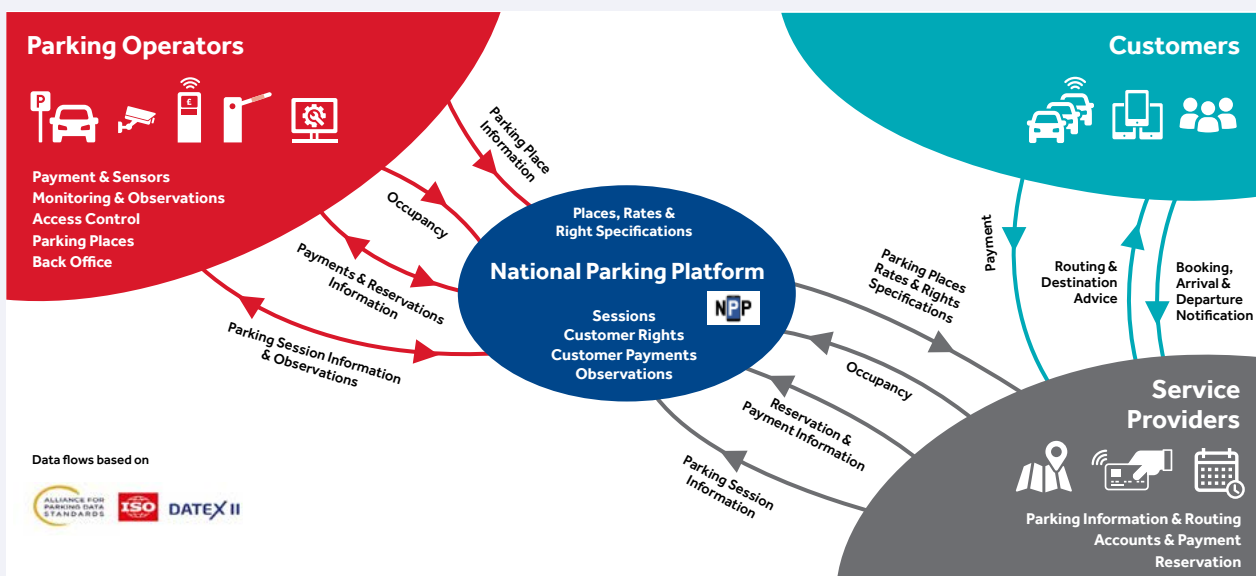
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<sup>1</sup> Department for Transport, [Toll Road Charges in England](#)

## Box A: The National Parking Platform - lessons for any future road user charging scheme

If we think of charging as a collection of tools, it opens up the opportunity to explore shared technology infrastructure. This can simplify road users' customer experience, for example by allowing them to pay all fees and charges in one place, while making it easier for private-sector players to introduce innovative services. The ongoing work on the National Parking Platform (NPP) gives a useful insight into how this type of platform can be developed and some of the challenges that will need to be overcome.

The NPP is an initiative aimed at improving customer experience across the full range of public and private parking, both on-street and off-street. It will allow customers to find a suitable parking space for their needs, check its cost and availability, pre-book a space, and make a payment, all in advance of setting out on their journey.



The NPP will link drivers, operators of parking facilities, and service providers, and it will allow:

- ✔ new and existing service providers to offer drivers parking options at the facilities of any participating operator
- ✔ operators to accept payments and reservations from any service provider without the need for a series of individual contracts
- ✔ customers to use any compatible app (including in-vehicle systems) to book parking at any participating location.

Local councils should also benefit from pooling the costs of delivering a step-change in the customer experience of public parking facilities.

The NPP is funded by the Department for Transport and hosted by Manchester City Council. A series of pilots involving Manchester and a small number of other areas have been successful, and development work is in train to support a nationwide roll-out from Autumn 2024 with 200 Local Authorities signed up. If successful, this should end the need for drivers to download multiple parking apps and will create a market that encourages competition and continuous improvement to customer service.

# Part 1 - Conclusions and call for action

**A national *pay-as-you-drive* scheme is becoming thinkable as a policy option for the UK – but political opposition means it is unlikely to be adopted in the short term.**

In recent years a significant number of large-scale schemes that charge groups of drivers for their road use have prospered across the world (see Section 2). A per-kilometre charge for HGVs is now commonplace across Europe. Many US states are in the process of introducing similar schemes for electric vehicles. New Zealand will extend its existing charging scheme for HGVs to electric vehicles from later in 2024.

Much (though not all) of this renewed interest is linked to public finances. The transition to zero-emission cars and vans is causing a rapid decline in the income governments receive from taxes on petrol and diesel.

This issue has also focused minds in the UK. The 2022 report *Road Pricing<sup>2</sup>* by the House of Commons Transport Committee argues that preparations should begin now to develop a charging regime to replace a loss of revenue from Fuel Duty, which will eventually equate to around 4% of all tax receipts – or 5p on the basic rate of income tax.

The Committee is not alone in policymaking circles in taking this view. A series of recent reports by think tanks and research organisations from across the ideological and professional spectrum have made similar arguments. Our review of these reports (see Section 2.1) reveals an emerging consensus among specialists that the UK should move towards replacing Fuel Duty with a charge for road use, eventually embracing all car, van, and lorry drivers. This consensus extends to many points of detail, for example that a simple “pence per mile travelled” scheme will be easiest to deliver. There is also agreement that pay-per-mile schemes can and should co-exist with congestion charges and air-quality zones where these are needed to tackle specific local problems.

The current UK (Conservative) Government and the Labour Opposition have both ruled out a national pay-as-you-drive scheme to replace Fuel Duty. This would seem to preclude such a scheme being introduced in the next five-year parliamentary session.

**The introduction of any form of charging for using roads will be built on three foundations: its policy rationale, its practical deliverability, and its political acceptability.**

It is worth stepping back and thinking about how we have arrived at this position and how we might break out of it.

A key idea that emerged from the expert roundtable we held in November 2023 is that proponents of any new charging scheme will need to be able to answer three interlinked sets of questions.

✔ **Policy:** what is the rationale for introducing charges for road use, what problems is it intended to help solve, and what other policies need to be in place to achieve these goals?

✔ **Practical:** how will the scheme be designed, under what kind of business model will it operate, what technology options flow from these choices, what data will be needed, and how will it be collected and managed?

✔ **Political:** what will make the proposal viable in its specific political and legal context, and what communications and public engagement requirements flow from this analysis?

If we apply this thinking at the UK-wide level, the policy rationale for a national pay-per-mile scheme is well developed. Part 2 of this report shows that there is also a rich international evidence base on which to build a sound technical platform. Unfortunately, as we have seen, the stance of the two main political parties in the UK indicates that the political context is extremely unfavourable.

**Political acceptability is the greatest barrier to a national pay-as-you-drive scheme**

To understand why the main parties have taken this stance we need to learn the lessons of the past. The last serious wave of interest in a national road user charging scheme ended badly. Politicians remember the 2007 online petition that attracted over 1.8 million

<sup>2</sup> Transport Select Committee (2022), [Road Pricing: Fourth report of the session 2021–22](#), House of Commons

signatures and forced Tony Blair's government to back away from a nascent proposal. In the intervening years, politicians have seen little evidence that public attitudes towards paying directly for road use have fundamentally changed. In fact, 2023 saw both a revolt against London's ULEZ and the cancellation of Cambridge's proposed congestion zone following public opposition.

The key lesson we take from this history – and recent international experience – is that governments need to commit time, money, and political capital into building very broad coalitions of support for change. In the UK context, we fear that the high levels of opposition will be difficult to overcome if any new scheme is widely understood as being driven solely by the government's financial woes. The picture is further complicated by public fears about privacy and data security raised by some (though not all) of the ways a technical platform for charging could operate.

This all suggests that, at least for the next five-year Parliament, UK ministers are unlikely to be willing to invest the political capital to try to unpick this dilemma. The same is not necessarily true in all contexts across the British Isles. The Welsh government, for example, operates in a legal context that could favour charging, shaped as it is by the [Well-being of Future Generations \(Wales\) Act \(2015\)](#)<sup>3</sup> and the move of the relevant ministerial portfolios to the Welsh Climate Change Ministry. The previous First Minister of Wales recently made it clear that there are no plans to introduce charging on trunk roads in Wales<sup>4</sup> but previously commissioned an [Independent Review of Road User Charging in Wales](#)<sup>5</sup>, suggesting the door is at least partially open. Similarly, some of the policy objectives of the Scottish government, notably its goal to constrain traffic growth, may also create a more favourable environment for developing charging options.

**Transportation professionals need to prevent the unpopularity of a national pay-as-you-drive scheme leading to all forms of charging for road use being taken off the table for a generation.**

The transportation community has an interest in preserving a variety of forms of charging for road use as part of the wider toolbox it can deploy to improve the

performance of the transport system.

If our analysis is correct, it would be a big mistake to believe – as some have argued – that it is inevitable that a universal road user charge will ultimately replace Fuel Duty. Contrary to popular belief, Fuel Duty does not *pay for the roads*. Like nearly all UK taxes, the money raised goes into a general taxation pot that is then distributed to meet the government of the day's priorities. The potential loss of up to 4% of all tax receipts is a problem at the macro level, but the government has many other options for raising revenue, many of them less politically problematic.

Charging for road use does not however begin and end with the revenue-raising possibilities of pay-as-you-drive road pricing. There are many uses of charging that have a policy rationale aimed directly at improving the performance of the road network alongside providing funds to support its maintenance. Congestion charging is probably the most widely understood example, but a non-exhaustive list will also include road tolls, "amazon taxes" on delivery vehicles, and low-emission zones. If we use a broad interpretation of charging for road use, this will also include measures aimed at stationary vehicles, including workplace parking levies and on-street parking management.

Charging should be seen as part of a wider toolbox of interventions that together aim to deliver both a better transport system and transport's contribution to other goals, including carbon reduction, economic development, and improved air quality. In this context we note that the Climate Change Committee<sup>6</sup> and the National Infrastructure Commission,<sup>7</sup> two key advisory bodies, have respectively called on the UK government to look again at the role of demand management (for which charging is a tool) as part of its approach to delivering transport decarbonisation and regional economic growth. In both cases, demand management is proposed as part of a suite of measures, including sustained investment in public transport, that make behaviour change viable for people currently dependent on the private car.

If we adopt this view of charging, the profession has a clear interest in ensuring that the whole concept is not dismissed as simply too difficult to deliver.

<sup>3</sup> Legislation.gov.uk: [Well Being and Future Generations Act \(Wales\) 2015](#)

<sup>4</sup> [Questions to First Minister, Senedd, 3 October 2023](#)

<sup>5</sup> Welsh Government (2020): [Independent Review of Road User Charging in Wales](#)

<sup>6</sup> Climate Change Committee (2023), [Progress in Reducing Emissions: 2023 report to Parliament](#)

<sup>7</sup> National Infrastructure Commission (2023), [Second National Infrastructure Assessment](#)

## Box B: Could charging for road space open up opportunities for more private investment in UK roads?

*How we pay for roads* is the point of departure for much of the renewed interest in road user charging in the UK. While this paper highlights some of the complexities obscured by this seemingly simple question, we wholeheartedly agree that the UK's strategic and local roads networks need significant investment.

We also recognise that public spending will be heavily constrained over the coming decade – so could there be a greater role for private investment in Britain's roads? To date the scope for these investments has been very limited, with the M6 Toll being the only major example to get off the ground in recent years. Globally, institutional investors do have a lot of money looking for a home. In 2023 sovereign wealth funds and public pension funds made investments of over £220Bn (and saw the total value of their assets rise to over £30Tn<sup>8</sup>). In November 2023 the UK Shadow Chancellor Rachel Reeves, speaking after a meeting with big investors, said that “under the right circumstances there are significant pools of private capital available to finance investments in critical national infrastructure such as clean energy, transport, and digital”.<sup>9</sup>

Elsewhere in this paper we argue that any charging proposal needs to manage an interrelated set of policy, technical, and political challenges. In the technical strand, an income stream from user charges can in principle support a business case for private investment. We recognise that the politics of any such move are likely to be very challenging in a period when private ownership of water and rail utilities is under intense scrutiny. However, given the scale of the investment needed, we think this is an option that is at least worth exploring – if nothing else to bring in fresh perspectives from the financial community to a policy area that needs new thinking.

## Box C: Capitalising on the transport sector's digital and data ambitions

Many organisations across the highways sector have set out ambitious visions for exploiting the opportunities of data and digitisation. This commitment, that in many cases is being backed by big investments into data quality, digital twins, and other technology infrastructure, will play a big enabling role in unlocking the full power of charging for road space.

National Highways (NH), perhaps the biggest player of all, has valued its data assets at £60Bn – equivalent to around 20% of its balance sheet.<sup>10</sup> This underpins its ambitious *Digital Roads*<sup>11</sup> strategy covering design and construction, operations, and the customer experience. NH wants to leverage its data to deliver a smoother-running network and give customers the information they need to feel in control of their journeys. This is not something that it can achieve alone, and partnerships and alliances are a key part of the approach. NH is clear that it wants to work with local highways authorities, other transport operators, vehicle manufacturers, mobile communications network operators, and many others in pursuit of a better customer experience and end-to-end journey support.

Engaging drivers and other road users in the debate will also bring many benefits. For example, we suspect one key to a better outcome over the long term is to encourage drivers to shift from seeing themselves as passive recipients of information to having a greater understanding of the role the data they can share will play in improving the reliability and robustness of the road network.

<sup>8</sup> Global SWF (2024), [2024 Annual Report: SOIs powering through crises](#)

<sup>9</sup> Catherine Moore (22 November 2023), [New British Infrastructure Council meets to discuss investment opportunities](#), New Civil Engineer

<sup>10</sup> National Highways (2021), [Digital Delivery: Enabling outcomes with digital, data and technology](#)

<sup>11</sup> National Highways: [Digital Roads](#): Accessed 5 March 2024



## Box D: Digital traffic regulation orders – a step towards a digital map of the network?

A digital map of which roads drivers will be charged to use is a fundamental requirement for any future large-scale charging scheme. Operators and drivers need to be confident that only vehicles using the relevant roads will be charged. The Autonomous Vehicles Bill currently passing through Parliament (as of February 2024) could be an enabler of this map. The Bill's provisions include a new obligation on local transport authorities to submit digital versions of traffic orders (which cover issues such as road closures and designation of parking bays) to a central platform. These digital traffic regulation orders (DTRO) could help charging schemes as they combine in one place the geographic elements (which roads are charged and at what rate) with other key information (legally enforceable access rights and permissions). Depending on the scheme coverage, managing the digital map of the charged roads could be a significant technical task. It is also absolutely a communications and education challenge, as the many complaints about signing of toll roads and low-emission zones demonstrate. Even a motorway-only scheme will need clarity as some A roads look like motorways to the driver (and conversely some motorways look like A roads). Technology can play its part here, but only if the digital map of "what's in the scheme" is open and fully maintained. The government's [time, distance, place pilot of 2007<sup>12</sup>](#) is a source of insight on this process.

### **We call on colleagues from across the transport sector to work with us to address issues standing in the way of charging for road use playing its full role in the transportation professional's toolbox.**

We are aware of several parallel initiatives through which colleagues are working together to support the case for a pay-as-you-drive road user charging scheme in response to the decline in Fuel Duty.

To complement that work, we want to work with colleagues from across the sector and beyond to identify issues standing in the way of the full range of charging options forming part of the toolbox available to the profession.

It will be important that there is shared ownership of this list of challenges, but to stimulate debate, we offer these questions that have emerged from this first phase of work.

- ✔ How can we make better use of the enormous volumes of data generated by the 40 million vehicles on UK roads to better manage use of road space through charging? How do we overcome privacy concerns, and how can we get stakeholders such as network operators, vehicle manufacturers, and insurers involved in this task?
- ✔ How in the UK's centralised political system can we draw on the USA's state-level experience that buy-in can be generated by introducing opt-in charging schemes that offer drivers a more attractive deal than current taxes?
- ✔ More generally, how can we put user choice of how and when to pay at the centre of future charging schemes?
- ✔ How can we build on the technical infrastructure developed to support low-traffic neighbourhoods, on- and off-street parking management, and other programmes that have shaped how road space is used? What are the political and policy lessons from this work?
- ✔ How can we operationalise the insight from the USA that up to 50% of the budget for successful charging schemes has been spent on communications and stakeholder engagement?
- ✔ How can we improve our understanding of which transport problems create the greatest opportunity to generate public support for moving towards using charging as a tool?
- ✔ How can we ensure that the technology platforms and operating models that support new schemes (a) deliver a good user experience, ideally allowing drivers to pay for multiple services in one place and (b) do not close off opportunities for further development, up to and including a UK-wide pay-per-mile road user charging scheme?
- ✔ How can we (or perhaps who can) develop the digital maps of the UK road networks that we will need to underpin future charging tools?

<sup>12</sup> Department for Transport (2011): Demonstration project on time, distance, place (TDP) road user charging

## Part 2 - Insights from our literature review and expert interviews

### 2.1 UK: The emerging consensus on pay-per-mile road charging among policy specialists

To support this paper CIHT has reviewed a wide range of publications related to road charging that have been released in the UK since 2020 (see Box E for a list of material reviewed).

This flourishing market in ideas has been catalysed by the projected decline in revenue from Fuel Duty and the belief that this creates an opportunity to rethink motoring taxation.

The organisations behind these studies come from a wide range of political and professional standpoints but share a surprising level of agreement on fundamental issues.

At the highest level this is represented by an overwhelming preference for the UK government to move towards a simple pay-per-mile charge to replace Fuel Duty. This approach is seen as technically easier to deliver than dynamic road pricing (varying charges to reflect time of day, level of congestion, etc.) and more importantly easier to understand for drivers. There is also widespread agreement that this kind of scheme can and should co-exist alongside congestion charges and fees for non-compliant vehicles entering low-emission zones where these are needed to deal with local problems.

The literature also revealed consensus on some of the desirable features of scheme scoping and design:

- ✔ Early and consistent clarity on objectives: for example, revenue raising, air quality, congestion
- ✔ Equity and fairness: public opinion work carried out to support some studies shows strong support (including among electric vehicle drivers) for all road users to contribute to the system's upkeep
- ✔ Mileage charges should reflect vehicle size, weight, and emissions
- ✔ Scheme design and technology must allow evolution and expansion. It should be technically and politically possible to add complexity later

- ✔ Multiple technologies for recording and reporting mileage can co-exist, from annual odometer readings through to real-time tracking via smartphone apps. Experience from the USA suggests choice can be left in the hands of drivers, which may in turn help overcome privacy and other fears.
- ✔ Openness and interoperability of payment platforms are also important. Ideally users should be able to pay all charges in one place.
- ✔ Enforcement only needs to be good enough to act as a deterrent. Schemes do not need to aim for 100% compliance.
- ✔ The roll-out of any new scheme should be phased and iterative. This will allow for policy, practical, and political issues to be ironed out.

There do however remain areas of disagreement, which highlight some of the key choices that would need to be made in the design of any large-scale pay-per-mile pricing scheme.

### Which vehicles should be the first to move over to pay-per-mile pricing?

There is consensus on the need for a phased roll-out to iron out problems. There is also agreement that starting with one relatively small category of vehicles would be a good way to trial technology and operations at a manageable scale. There is however disagreement in the literature about whether the target category should be zero-emission vehicles (ZEVs, primarily electric) or HGVs. Starting with ZEVs would speak to the fairness and equity argument, given these drivers do not currently pay Fuel Duty.

There are also opportunities to learn from practice in several US states (see Sections 2.2 and 2.3). There are obvious concerns about the effect on ZEV sales and the impact a slowdown would have on the UK's Net Zero ambitions. Starting with HGVs would allow the UK to learn from the HGV charging schemes in place across Europe (see Section 2.3) and potentially piggyback on technology already widely used in the industry, all reducing the need for extensive trials. One argument

against using HGVs as a test bed is that the Fuel Duty they currently pay is easy to collect and is already a form of pay-as-you-drive taxation, undermining the rationale for disruptive change. This however only speaks to the revenue-raising aspect of a charge and does not consider the additional damage caused by heavy vehicles to the road surface or policymakers' legitimate wish to influence route choice.

### **Should the new regime be driven from the centre or should we be empowering bottom-up change?**

This choice raises several practical questions. Should central government build a single national charging platform integrating all national and local charges for road space, or should it limit itself to setting standards for an open system that allows players such as insurers different ways to pay alongside other services? Similarly, if road user charging, congestion charging, and clean air zones are to co-exist, who should lead on deciding when and where they are required? There is a strong case for local choice on such sensitive issues but also a risk of incentivising a race to the bottom or a postcode lottery that would work against the need to deliver fairness and equity.

## **Box E: Selected recent reports and insights from UK businesses, think tanks, and research organisations**

Campaign for Better Transport (2022), [Pay-as-you-drive: The British public's views on vehicle taxation reform](#)

Dillon Smith and Tom Clougherty (2023), [The Future of Driving](#), Centre for Policy Studies

Ben Southwood (2022), [A New Deal for Drivers: Unleashing the power of Britain's greatest infrastructure resource](#), Policy Exchange

KPMG (2022), [The Future of Road Pricing: Key considerations in the UK and lessons from the US experience](#)

Local Government Association (2022), [Understanding Local Authorities' Views on a National Road User Charging System](#)

RAC Foundation (2022), [Fuel Duty Decline: A technical note](#)

Resolution Foundation (2023), [Where the Rubber Hits the Road: Reforming vehicle taxes](#)

Scott Corfe (2022), [Miles Ahead: Road pricing as a fairer form of motoring taxation](#), Social Market Foundation

Jorgen Pedersen (2023), [Road User Charging: Is the technology there yet?](#) SYSTRA

## **2.2 USA: Summary of recent developments at the state level**

The USA has a mixture of federal and state taxes on fuel and vehicles, alongside a wide range of state-level tolls and charges for road use. Unlike in the UK, there is a high level of hypothecation, meaning many tolls do go directly into spending pots that support road infrastructure, although the money raised is not sufficient to cover expenditure by the federal government or the majority of the states. As in the UK, revenue from taxation of petrol

and diesel is in sharp decline, which has in turn created the political space to explore alternatives.

This means that the USA, and in particular many of its 50 states, has provided a rich source of learning on the practicalities of introducing new forms of charging, embracing a variety of approaches and under a wide range of political leaderships. We would like to thank Steve Morrello of Route 66 Conseil for his help in deepening our understanding of the current state of play in the USA.

As the map in Figure 1 shows, most of the US states have expressed an interest in introducing road user charging. Since 2000, 24 US states have engaged in policy or technical research on distance-based road usage charging (RUC),<sup>13,14</sup> including six of them running formal trials<sup>15</sup> and five participating in a multi-state coalition demonstration.<sup>16</sup> By January 2024, 19 states considered RUC via studies or pilots: California, Washington, Nevada, Colorado, Wyoming, Kansas, Oklahoma, Minnesota, Missouri, Illinois, Indiana, Ohio, Maine, Pennsylvania, Delaware, Maryland, New Jersey, North Carolina, and Georgia. Bills have become law in five states: Hawaii, Oregon, Utah, Virginia, and Vermont. Groups have been set up such as RUC America and the Eastern Transportation Coalition to promote and integrate these schemes.

Interestingly, the RUC schemes in Hawaii, Oregon, Utah, and Virginia are all currently opt-in – speaking to the need to build public understanding and confidence in these types of schemes. In Hawaii, for example, the user can pay an EV registration surcharge or participate in

the RUC scheme (which will become mandatory in 2028), with per-mileage fees capped at the level of the annual surcharge. The fees themselves are calculated and collected via odometer readings taken during a vehicle's compulsory annual inspection.

A key lesson from the USA is the amount of the budget for the introduction of charging committed to communications and engagement – reported to us as being up to 50% in some cases. Taking Hawaii again as an example, its Department of Transport wrote to all 360,000 registered vehicle owners to share a dummy invoice to demonstrate what they will typically pay under the RUC scheme compared with current charges. Also, as well as state-level initiatives, there is a federal grant programme.

These schemes are explicitly designed as revenue-raising exercises and, as explained in Section 1, we are sceptical that such schemes will prosper in the UK context – but they do provide useful insights into how to build support, deal with technical challenges, and deliver change on an iterative basis.

### Five states have enacted RUC in Law

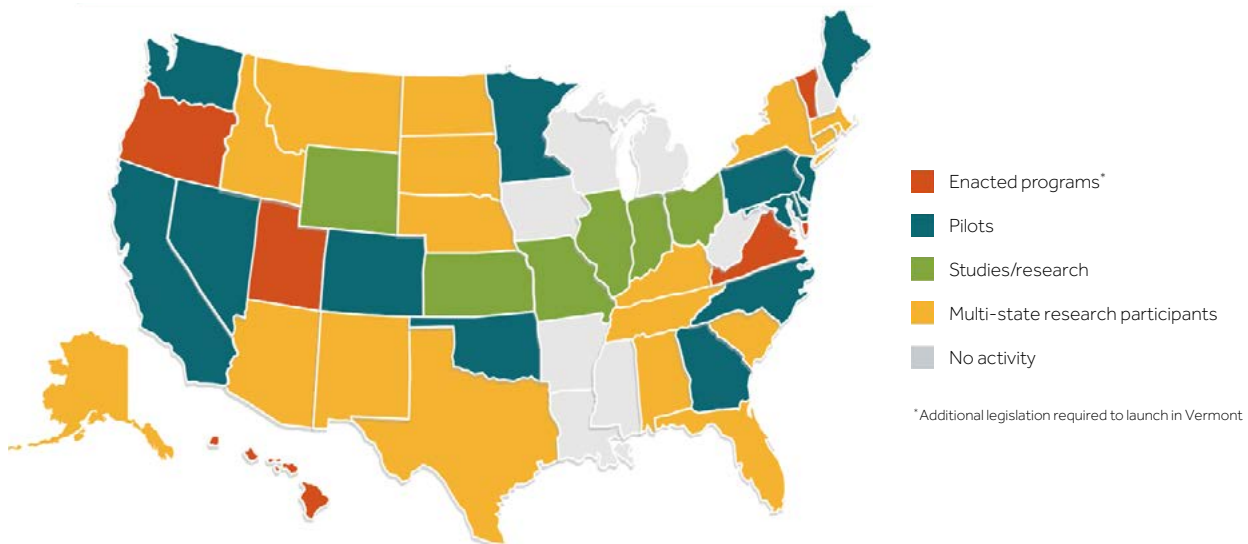


Figure 1: US state activity – Courtesy SPRUCE

<sup>13</sup> In the USA, the term road usage charging, or RUC, means charging for distance travelled within a jurisdiction's road network. In some states, distance-based charging is referred to by other terms, such as mileage-based user fees (MBUF), or Vehicle Miles Tax (VMT), or mileage fee. RUC in that context does not mean the same as in the European road user charging Directive 1999/62.

<sup>14</sup> 17 of the states are members of the RUC America coalition: Oregon, California, Washington, Utah, Hawaii, Colorado, Nevada, Wyoming, Idaho, Arizona, New Mexico, Texas, Oklahoma, Montana, North Dakota, Nebraska, Alaska: <https://www.rucwest.org/>. Five are members of the Eastern Transportation Coalition (Delaware, Pennsylvania, Virginia, New Jersey, North Carolina), and the remaining two are Minnesota and Kansas.

<sup>15</sup> Oregon (2006–07, 2012–12), Minnesota (2006, 2012), California (2016–17), Colorado (2016–17), Washington (2019–20), Hawaii (2019–21).

<sup>16</sup> Delaware and Pennsylvania (2018 and 2019) and New Jersey, Virginia, and North Carolina (2020).

One example of charging for road use in the USA that does – at least potentially – address wider transportation problems is an emerging interest in package delivery taxes, currently being pursued in Minnesota and Colorado. However, perhaps the most sophisticated attempt to use this tool is European, in the form of Barcelona’s introduction of an income tax of 1.24% on all delivery companies with an annual turnover of more than €1M that operate in city.

Introduced in March 2023 the tax is an explicit effort to charge these businesses for their use of public space, while also pursuing goals of reducing congestion, encouraging wider use of delivery hubs, and creating a

more level playing field for physical shops in the Catalan capital, which pay a range of city taxes not imposed on their e-commerce competitors. It is too early to judge if what has been nicknamed the “Amazon Tax” will meet these goals – but what is already clear is that Barcelona’s experience is generating a lot of lessons about the difficulty of implementing such a scheme. The city has become embroiled in a series of legal disputes with the Catalan and Spanish courts and competition authorities – the most striking of which has resulted in Amazon itself successfully arguing that it is a logistics business that subcontracts out its deliveries and is therefore not liable to pay the tax.

### 2.3 Summary of selected live pay-per-mile/km schemes in Europe, USA, and New Zealand

With the support of CIHT Technical Champion Andy Graham and his SPRUCE colleagues, we have begun to collate a list of pay-per-mile or kilometre schemes in operation across the world. As we develop this work, we intend to update this list and expand it to include examples of other types of charges for road use. We hope it will be a useful tool for transportation professionals and others involved in developing and promoting proposals for charging for road use.

<b>Europe overall</b> ✓ Strong trend towards compulsory per-km road use charging for HGVs. ✓ The majority of networks covered by these HGV schemes charge lighter vehicles a flat toll, payable via purchase of an electronic or physical vignette ✓ The European Electronic Toll Service (EETS) is designed to enable the payment of tolls through a single contract, a single EETS provider, and a single vehicle device (OBU – on board unit) throughout the EU. Toll customers can enter into a contract with an EETS provider of their choice. As required by Directive 2004/52/EC, this is intended to achieve interoperability of the electronic road toll systems in the EU ✓ This summary focuses on states that have introduced road user charges (fees that are at least in part linked to the polluter pays principle or other transport policy objective). Tolls (fees paid to organisations operating parts of the road network, often as private concessions) are also used extensively in France, Spain, Portugal, Italy, Norway, Denmark, and Sweden					
State	Roads affected	Vehicles subject to per-km charges	Technology	Charges vary by	Notes
<small>GNSS = global navigation satellite system                      DSRC = dedicated short-range communications (beacons on gantries with onboard tags)</small>					
Austria	Motorways and expressways, some tunnels, and mountain passes	HGVs (over 3.5t) and buses	DSRC and toll gantries for some tunnels and mountain passes (for all vehicles)	Number of axles Emission class of vehicle	Austria's federal highways company does not receive subsidies from the national budget and uses toll proceeds to fund construction, operation, and safety of the network
Belgium	Main roads (all roads in Brussels Region)	HGVs (over 3.5t)	GNSS	Flanders, Wallonia, and Brussels define their chargeable networks and set fee levels	In Flanders and the Brussels Region, the charge per kilometre is a tax. In Wallonia, it is a fee subject to VAT as the roads are managed by a private company (Sofico)
Bulgaria	Motorways, expressways, and some lower classes of roads	HGVs (over 3.5t)	GNSS	Weight Number of axles Emissions class Class of road	A government-sponsored OBU is available against a deposit, but drivers can also use other certified GPS devices. Funds are used to support highways construction and maintenance and safety
Czech Republic	Motorways and expressways	HGVs (over 3.5t)	GNSS	Weight Number of axles Emissions class of vehicle Class of road Time of day	Drivers can use any compliant OBU device Discounted rate for buses
Germany	Federal highways and major roads	HGVs (over 3.5t from July 2024; currently over 7.5t)	GNSS	Number of axles Emissions class of vehicle	Initially a joint venture led by Deutsche Telekom AG, Daimler AG, and Cofiroute. Taken over by German government in 2018
Hungary	Motorways, expressways, and main roads	HGVs (over 3.5t)	GNSS	Number of axles Emissions class of vehicle	Exemptions for buses First fully open market system in Europe. More than 20 service providers offer automated toll declarations using (existing) fleet management tracking devices to reduce costs
Poland	Some motorways and expressways	HGVs (over 3.5t)	GNSS	Weight Emissions class of vehicle Class of road	All proceeds allocated to National Roads Fund. Drivers can also use certified GPS devices or a smartphone app using geo-positioning
Slovakia	Motorways, expressways, 1st- to 3rd-class roads	HGVs (over 3.5t)	GNSS	Weight Number of axles Emissions class of vehicles Class of road	
Switzerland	The total distance travelled on all roads is measured	HGVs (over 3.5t)	OBU with tachograph now being replaced by windshield-mounted OBU	Weight Emissions class of vehicle	Proceeds fund road and rail infrastructure
<b>US states</b> ✓ Emerging trends for voluntary schemes replacing additional registration fees for electric vehicles ✓ EV registration fees are in place in some of the 50 US states					
State	Roads affected	Vehicles subject to per-km charges	Technology	Charges vary by	Notes
<small>GNSS = global navigation satellite system                      DSRC = dedicated short-range communications (beacons on gantries with onboard tags)</small>					
Hawaii	All roads	Electric vehicles only until 2028	Odometer reading at annual MOT equivalent	Until 2028, the programme offers a choice between a flat annual surcharge or a per-mile fee capped at the annual surcharge amount	Currently voluntary (will launch in July 2025) Due to become compulsory from July 2028 Target date of 2033 to extend RUC to all passenger vehicles
Oregon	All roads	Voluntary RUC programme for light-duty passenger vehicles	Private-sector account managers offer variety of ways to report mileage and pay fees GNSS and odometer options available	Drivers of conventional vehicles receive a credit for fuel tax Drivers of EVs and high fuel-efficient vehicles have discounted registration fees	Currently voluntary – in operation since 2015: 810 EVs, hybrids, and fuel-efficient vehicles Has received federal funds to support public awareness strategy and to explore technology options and interoperability with other states' systems
Utah	All	Voluntary RUC programme for light electric vehicles and hybrids	GNSS app (photos of odometer reading on smartphone are reported via the app)	Drivers of EVs are exempted from supplementary registration fees	Voluntary scheme. Single third-party provider App provides additional services relating to driver safety, car usage, etc
Virginia	All roads	Voluntary RUC programme for light electric vehicles and hybrids	GNSS or odometer reading	Replaces highway use fee Fee cap	Established in July 2022 12,000 EVs, hybrids, and fuel-efficient vehicles registered
<b>Oceania</b> ✓ New Zealand is pursuing a combination of the trends described for other regions					
New Zealand	All roads	Light electric vehicles, all diesel-powered vehicles, HGVs (over 3.5t)	GNSS or odometer or reading Heavy vehicles must use an approved hubodometer attached to the wheel axle or an approved electric distance recording system	Number of axles EVs over 3.5t remain exempt until December 2025	Extends to EVs from 1 April 2024 All vehicles must have a distance licence that exceeds the number of km travelled. Prepayment for units of 1,000km



CIHT provides strategic leadership and support to help our members develop, deliver, and maintain sustainable solutions for highways, transport infrastructure, and services that:

- ✔ **Address the challenges of climate change**
- ✔ **Support the economy**
- ✔ **Help address societal inequalities**
- ✔ **Reduce environmental degradation**
- ✔ **Respond to a changing world**

We bring members together to share, learn, and feel confident about addressing these challenges through the application of good practice, by embracing innovation and by acting with integrity. It is through this and the values that CIHT can demonstrate and deliver on thought leadership and shaping the highways and transportation sector for the public benefit.

Whether you are a student, apprentice, work in the private or public sectors or are a company director, CIHT has a place for you and a commitment to fulfilling your professional development needs throughout your career.

CIHT will be using these messages in discussions with relevant political parties and interested stakeholders to show how a properly funded and managed highways, transportation and infrastructure network will enable delivery of many key strategic aims.

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