



Outsourcing Tax Collection to Insurance Companies and Replacing Fuel Duty and VED with a Mileage-based Road Tax

1 March 2017 Main Submission
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How Can We Pay For Better, Safer, More Reliable Roads In a Way That is Fair To Road Users and Good For the Economy and the Environment?



WOLFSON
ECONOMICS PRIZE
———— MMXVII ————

Outsourcing Tax Collection to Insurance
Companies and Replacing Fuel Duty and
VED with a Mileage-based Road Tax



Gergely Raccuja

A Mileage-Based Road Tax

Gergely Raccuja was born in Budapest, Hungary. He read Politics, Urban Planning and Italian at UCL, graduating in 2015 with First Class Honours. In January 2016, he started as a Graduate Transport Planner at Amey Consulting in Birmingham. He has a keen interest in the role that technology will have in shaping the future of transport.

The Wolfson Economic Prize invites entrants from around the world and all sorts of backgrounds to propose original, well-argued and informed solutions to big national challenges. The aim is to bring forward fresh thinking to help people, governments and businesses develop practical policies.

This year the prize addresses an issue at the heart of every country's economic future: road infrastructure, and

how can we pay for better, safer, more reliable roads in a way that is fair to road users and good for the economy and the environment?

The way cars are powered, driven and owned is being revolutionised. Soon a world of cleaner, automated vehicles will arrive and old annual charges and petrol taxes will no longer work. A new kind of driving will take a new kind of road and a new kind of funding – ideas needed not just in Britain but around the world.

The five shortlisted submissions – of which this is one – show that it is possible to come up with potential answers that can help road users, improve safety, protect the environment, and support our economy.

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What Happens Next

Shortlisted entrants will be offered the chance to submit a revised and expanded submission. Shortlisted entrants are free at this stage to join up with others to help develop their proposals, including entrants whose submissions were not shortlisted.

These finalists will be given until June 2017 to expand their submissions before the Judges consider the winner. All shortlisted entrants who provide expanded submissions will receive £10,000. The winning entry, designated by the judges, will receive £250,000 in total. The Judges expect to announce the winner in July 2017.

The Judges also have the discretion to award further smaller prizes to recognise entrants whose submissions address aspects of the Prize Question in innovative, creative or otherwise outstanding ways, in particular giving weight to the use of technology. The winners of any such awards may not comprise a full entry for the £250,000 prize.

[The Judges' decision is final.](#)

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List of Acronyms

AV	Autonomous Vehicles (SAE level 4 automation)
AFV	Alternative Fuel Vehicle
BCR	Benefit to Cost Ratio
BIBA	British Insurance Brokers Association
CIHT	Chartered Institute of Highways and Transportation
COx	Carbon-oxides (mono and dioxide)
DfT	Department for Transport
HE	Highways England
HMRC	Her Majesty's Revenue and Customs
IPT	Insurance premium tax
LHA	Local Highway Authority
MaaS	Mobility as a Service
NMU	Non-motorised user
NOx	Nitrogen-oxides (mono and dioxide)
PM	particulate matter PTEG (UTG) Urban Transport Group RAC RAC Foundation
SMMT	Society of Motor Manufacturers and Traders
SRN	Strategic Road Network,
VED	Vehicle excise duty
VAT	Value added tax

List of Definitions

Near future	0-5 years
Medium term	5-20 years
Long term	20+ years
Hypothecation	Ring-fencing revenues from a specific tax in order to use them for a particular purpose only.
Base year	First year in which the new road tax is introduced.
Future years	All years after the base year.
LHAs	Is used in the finance section in particular, and it refers to the relevant regional highway authority, therefore it includes unitary authorities. It is used in contrast to Highways England.
Drivers/users	These terms are all referring to whoever is the registered keeper of the vehicle, not only the person driving a vehicle.
Young drivers	Drivers aged between 18-25 years.

Non-technical Summary

This proposal consists of the introduction of a new road tax, to replace both existing direct taxes on motorists: Vehicle Excise Duty (charged on CO2 emissions) and fuel duty (charged on fuel consumption). The new road tax will be defined by the weight and the harmful emissions of the vehicle and multiplied by the annual mileage of the vehicle. The new tax will be revenue neutral when first implemented, but it is expected to grow in income with increasing traffic levels. The new tax will aim to give some overall spending relief to those in the second lowest income quintile, in line with recent government policy aspirations. Additionally, the removal of Insurance Premium Tax on telematics insurance policies for young drivers will give them better chances of owning a car sooner while aiming to improve driving behaviour and thereby reduce road traffic collisions cause by young drivers.

The new road tax will be collected through private motor insurance companies, because they already have all the details required for calculating the correct amount of tax per vehicle. In the future, whenever someone's insurance is due for renewal, they will receive their road tax bill together with their new insurance quote. It will be an easy and straightforward system when buying a car too, because insurance quotes (and by extension the road tax due on the car) can be viewed before buying it. The amount of road tax would be the same regardless of the insurance provider and could be paid in all the ways that insurance can be paid. This clarity would allow car users to understand exactly the environmental and

social impact of their driving, much like the smart meter programme does with energy use, currently being rolled out by the government.

The new tax will be financially, socially, and environmentally sustainable, because the following inputs will determine it:

- The vehicle's impact on the road surface (measured by the weight of the vehicle),
- The vehicle's impact on congestion (primarily miles driven – but with the option of adding a discount for users who choose to drive at a non-congested time or location),
- The vehicle's impact on the environment (all harmful emissions including COx, NOx and particulate matter).

Considering all three of these factors will make the tax regime fairer for all road users, because the tax burden's proportionality to both weight and usage would bill those who do the most damage to roads more highly than those who do less damage. It would be good for the environment and public health because it would discourage buying and using more pollutant vehicles (such as diesels) particularly if they are used frequently and for long distances. It would be good for the economy, because it would guarantee that a part (20%) of the revenues from the new road tax would be reinvested in the local road network, where the user generated those revenues in the first place. This will create a direct link between the tax burden of individuals

and the pleasure and benefit of improving something that they see and use every day. It would also help to reduce unemployment in parts of the country, where low skilled workers could find medium term employment within the local construction and highways maintenance industry.

If road users have a telematics insurance policy they would have the opportunity to pay for each journey in a completely pay-as-you go system. They could also get a discount for travelling on non-congested roads and outside peak hours as part of a demand management trial. Their contribution would also be split between Local Highway Authorities in the proportion that they travel on their roads. HGVs could get a special discount if they use the Strategic Road Network (SRN) as opposed to local roads (where available), because the SRN is better equipped to bear heavy loads.

The ring-fencing would fund better roads, because with a net spending increase of £3.6bn, it would reduce the maintenance backlog of the local highway network. Money invested in the local highway network would bring safety benefits, because the vast majority of cycling and pedestrian traffic is on the local highways and they are much more exposed to poor road surfaces than motor vehicles. The reduction in the price of telematics insurance policies for young drivers will lead to a greater uptake in those policies, which should also contribute to accident reductions within that vulnerable age group and therefore contribute to safer roads overall. Furthermore, eventually telematics insurance policies might become mainstream enabling a fully pay-as-you-go road tax system. When that occurs, there will be a possibility to begin

implementing wider ranging demand management measures, which could eventually reduce congestion and improve Journey Times in the medium term.

To win public support for the proposals the marketing has to emphasise the intervention's revenue neutrality and the scrapping of VED and fuel tax. The second most important marketing tool will be the emphasis on financial and geographical ring-fencing of 20% of revenues from the tax for investment in road maintenance. The third key message needs to be on the convenience of the new regime, because users won't need to bear any additional practical burdens, simply renew their insurance and pay their road tax bill on one go. The marketing will also need to emphasise that no additional data is required for the collection of the tax, apart from what insurance companies already hold on car owners.

The most important long term benefit of the road tax system is its adaptability to future changes and trends, because of the simple mileage based principle at its core. This new way to pay for our roads will appeal to the public, because it will make life simpler and fairer for individuals and people will be able to accurately say: "I'm paying road tax".

1. Introduction

The prize question “How can we pay for better, safer, more reliable roads in a way that is fair to road users and good for the economy and the environment?”, is seeking to find a solution to all the problems of Britain’s highways. Despite the challenge, this answer is based on a relatively simple idea. It sprang into existence while trying to combine the need to transition to a pay-as-you-go system for motoring, and thinking about how it can be done most quickly and cheaply.

It was evident that the times have changed and the VED and fuel duty are obsolete ways of taxing motoring. Existing technological development is putting the government under pressure to reform, with imminent future technological development risking leaving behind the government altogether. This proposal is one that would allow the government not only to catch up, but anticipate and adapt to future changes in road transportation.

radical transformation in the transport sector since the invention of the car. A detailed study on the possibilities of MaaS in the UK is available [here](#). The service is already live in Helsinki, Finland.

All potential ramifications of the combination of the widespread use of MaaS and AVs are impossible to foresee. However, one possible trend is the gradual transformation of the car as a private mode of transport to the car as a public mode of transport. If this shift was to occur, it would most likely have the following consequences:

- reduction in private vehicle ownership,
- increase in vehicle miles,
- increase in the car’s modal share.

The large-scale take-up of both electric vehicles and hybrid engines will lead to decreasing fuel consumption.

Outside London the car rules the road, preventing modal shift to more sustainable modes from being viable. This is unlikely to change in the medium term. On the contrary the combination of MaaS and AVs might increase it further.

The increase in last mile deliveries (“white vans”) will continue (in the short-medium term at least), which will lead to more demand for local roads, where those deliveries occur.

Third party (and comprehensive) insurance will be as important in the medium term as it is today. This is because the fundamental concept of insurance as spreading the cost of risk across all users exposed to risk will remain true in the future. The insurance burden might shift from individual owners to manufacturers (e.g. Volvo) with the development of AVs, but there will remain a third-party insurance market even after AVs, because people might continue to want to drive manually for the purpose of enjoyment.

Concerns around privacy are stronger in older generations, and younger generations are less concerned about this (nothing proves this better than our default acceptance of Google’s and Facebook’s ownership and use of our data).

Younger people are also more sensitive to prices, which is a key reason for the sharp uptake in telematics insurances over the last few years (BIBA). Drivers with a telematics insurance are less likely to be involved in a road traffic collision.

At present mobile phone data is not uniquely linked to individual vehicles and vehicles create traffic on the roads not individual users (they could be passengers in a car for example). This makes mobile based road tax payment impossible – in the short term.

by the annual mileage of the vehicle. The new tax will be revenue neutral when it is first implemented, but it is expected to grow in income over time, thus reversing the decline of income from fuel duty.¹ The new tax will aim to give some overall spending relief to those in the second lowest income quintile, in line with recent government policy aspirations. Additionally, the scrapping of IPT on telematics insurance policies for young drivers (between 18-25) will be included in the policy intervention package, which should bring down accident rates as well as providing synergies with the new road tax regime².

Crucially, the new road tax would be collected through private motor insurance companies, because they already have all the personal and vehicular details that are required for calculating the amount of tax owed by each individual car owner. In the future, whenever someone’s insurance is due for renewal, they will receive their road tax bill together with their new insurance quote. It will be an easy and straightforward system when buying a car too, because insurance quotes (and by extension the road tax due on the car) can be viewed before buying it.

¹ The sooner it is implemented the better, since revenues from fuel duty are decreasing every year despite growing vehicle use: see Table 1.

² This standalone policy is originally recommended by BIBA and also mentioned in the DTI’s 2015 Road Safety statement, but it synergises well with the main policy intervention, therefore I have included it in the proposed system.

2. Assumptions

Attitudes to a new pay-as-you go style road tax will be similar to attitudes towards road pricing surveyed in the 2011 [RAC study](#) by John Walker (page 28-33).

Level 4 autonomous vehicles (AVs) will become available in the medium term. Industry experts currently estimate the technology to take another 10 years to develop.

Mobility as a Service (MaaS) will become the way to travel in the medium- and long-term future. This will be the most

3. The Proposal

The proposal consists of the introduction of a new road tax, to replace both existing direct taxes on motorists: Vehicle Excise Duty (VED) and fuel duty. The new road tax will be defined by the weight and emissions of the vehicle and multiplied

The amount of road tax would be the same regardless of the insurance provider and could be paid in all the ways that insurance can be paid. This clarity would have a positive behavioural impact because it will help motorists to understand the environmental and social impact of their driving; much like the smart meter programme does with energy use.

Insurance companies would incur minimal cost in implementing the system, because there will be little additional administrative work to be done since they are doing most of it already by nature of their business. They would also make a very small margin on the revenue (approximately 0.003% or initially £1m), which would incentivise them to find the best way of administering the system. The tax would save money for the public purse because it would remove the cost of collecting and enforcing both fuel duty and the VED. Therefore, the effective cost of collecting this tax would be the insurance companies' margin plus the initial setup costs of issuing guidance to insurance companies and some additional checking of insurance companies' accounts. The former is not expected to exceed the existing cost of collecting VED, while the latter should already be in HMRC's expenditures, in relation to collecting insurance premium tax from insurance providers.

The data required to calculate the amount of tax due is only the vehicle registration number and the annual mileage of the car. From the registration number the calculator will produce a rate for that specific vehicle, which will then be multiplied by the annual mileage. If the insurance includes a telematics device, the estimated annual mileage will not be

required, because it can be billed to the person on a monthly pay-as-you-go basis and collected by the insurance company via direct debit. Such a system would make using the roads not dissimilar to using electricity and gas in the current system.

The new tax will be financially, socially, and environmentally sustainable, because the following inputs will determine it³:

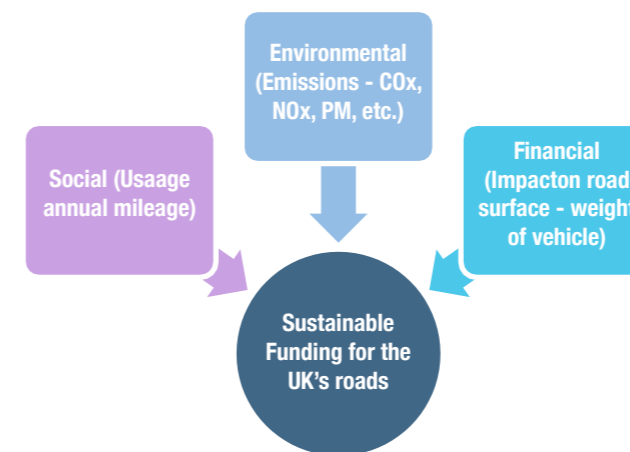
- The vehicle's impact on the road surface (measured by the weight of the vehicle),
- The vehicle's impact on congestion (primarily miles driven – but with the option of adding a discount for users who choose to drive in a non-congested time or location),
- The vehicle's impact on the environment (all harmful emissions including CO_x, NO_x and particulate matter).

In theory pedestrians and cyclists would be subject to the same rates, but in practice because their impact on congestion and the environment are negligible they would be exempt from it. It can be noted that HGVs would be impacted severely due to their high emissions and their adverse effect on the road surface. However, this is offset with the benefits they get from the scrapping of the fuel duty, since their fuel consumption is the highest for all user classes. Furthermore, HGVs could get a discount if they are using the Strategic Road Network (SRN) instead of local roads where possible.

³ The exact ratios in which these figures should influence that final per mile rate can be determined after consultation with environmental experts and highway engineers.

The new tax would link the cost of road maintenance more fairly with those who are a major cause of that maintenance.

Figure 1 The Three Components of the New Road Tax



One of the main benefits of this tax regime is that it not only spreads the cost more evenly across all users but it enlarges the tax base altogether. The two categories of vehicle not taxed under the previous system were:

- vehicles not currently registered in the UK (currently exempt from VED)
- all alternative-fuel-powered vehicles (exempt from both VED and fuel tax).

This is important since both categories still contribute to congestion and cause damage to roads and therefore should also contribute to their maintenance.

4. The 5 reasons for change

Transparency and choice

Some people are unaware that VED is an emissions tax and not a road tax, whereas others do not know that the price of fuel includes a tax, or that it accounts for approximately half of the total cost of filling up the tank. The current system of taxation for motoring is not transparent and understanding the real cost of using the road network requires complicated calculations. For all users to be able to make more informed decisions, the pricing system of the roads needs to be more straightforward. This does not mean that the considerations behind the tax need to be simplistic (such as the VED only measuring CO₂ emissions), but that the bottom line price needs to be easily accessible to users. Therefore, for any new system to become popular it should reduce the practical burden (on all road users) and the financial burden (on most road users) by simultaneously reducing the operational costs of the regime and widening the tax base to previously not captured vehicles.

Furthermore, if the new system is able to take into account and reward people for making socially beneficial and sustainable [choices](#) about when and where they travel, then the taxation system will receive a much stronger popular support, especially from younger generations. However, it is vital that the introduction of these choices do not come at a high cost for those who do not want to make such choices, because the majority of people still feel their car use is always necessary and not a flexible choice ([RAC](#) page 31).

The car insurance market has greatly benefited from comparison websites. These provide a clear idea to the customers regarding insurance policies that are available to them and their price. In the new road tax would appear alongside every single insurance quote as the same figure, with the option to view details of how the calculator arrived at the figure. Because this can be viewed prior to purchasing a vehicle, individuals will be able to estimate the costs involved at an earlier stage with something that they already do (if not via a comparison website then through their own insurer.) With fuel tax it is difficult to estimate the annual cost because manufacturers have unrealistic figures and for many people are not aware of how much tax they pay on fuel

Finally, choices can be easily included in the tax regime after users have become accustomed to the system. For example, once telematics insurance policies have become even more widespread, the government can decide to give discounts if users decide to avoid the peak hours or if they avoid driving through a congested route. This demand management would be the most immediate and effective way to reduce congestion on the road network. However the 2011 RAC study found that road users were particularly hostile towards

managing demand over time and space (page 28). Therefore, it is prudent to have a new tax system with the potential to upgrade to demand management, but which does not include severe demand management measures initially.

2.Improving air quality

The current system is skewed in favour of diesel vehicles which are both more fuel efficient and emit less CO2, meaning that those who drive them need to pay less fuel duty and VED. This has led to a consistent growth in the uptake of diesel vehicles, which currently still have 45% market share as of January 2017 ([SMMT](#)). Paradoxically, diesel engines are in large part responsible for the worsening [air quality](#) throughout the UK. Their increased particulate matter and NOx emissions mean that while they might produce less greenhouse gas emissions they are far more harmful to people's health than other fuel types. Therefore, the new system needs to have a more sophisticated approach to environmental sustainability and look at all harmful emissions that road users generate, not just CO2.

The urgency of this problem is not to be underestimated and the government needs to take

immediate action following the high court ruling on the 2 of November 2016 ([Client Earth](#)). The Clean Air Zones in the government's plans are a good start, but the ultimate incentive has to be related to all vehicles in any area of the UK, not only where they are in the highest concentration.

The proposed road tax system would address the problem of air quality at its roots. Those pollutant vehicles that drive more miles should pay more tax than those pollutant vehicles, which are

rarely used. Diesel vehicles have been in the limelight since the Volkswagen emissions scandal and because they get too big of an advantage under the current tax regime. Their lower fuel economy means that they were the obvious choice for those who drive long distances, business users in particular. A one-off tax might prevent people from buying new vehicles but will not prevent the existing ones from driving more miles ([CIHT](#)). Therefore, the tax on diesel vehicles needs to be based on all harmful emissions, which is the only way to tax them fairly in comparison to petrol cars.

3.Tackling congestion and guaranteeing future revenues

Thirdly, alternative fuel vehicles (AFVs)

are currently exempt from all taxation (since they don't produce CO2 and do not use fuel at all) but they still contribute to [congestion](#) on the road network and damage to the road surface. Therefore, while some view fuel duty as a sufficiently proportionate tax on vehicle use at present, this will not remain so in the medium term. AFVs, including electric vehicles, which now account for 4.2% of the car market, are growing at a 20% annual rate ([SMMT](#)). The new road tax needs to consider all those vehicles that contribute to congestion on the road network. Table 1 shows that between 2010 and 2015 traffic grew by 4.5% but fuel duty revenues only grew by 3.7%. This slowdown is set to continue and government revenues will shrink further without intervention.

Table 1 Change In Traffic And Fuel Duty Revenues 1995 And 2015 (See Appendix 1)

Traffic vs. Fuel duty revenues	change in road traffic		change in fuel duty revenues	
	total growth	average annual growth	total growth	average yearly growth
1995 – 2000	8.5%	1.7%	58.0%	11.6%
2000 – 2005	5.9%	1.2%	3.5%	0.7%
2005 – 2010	-1.2%	-0.2%	12.4%	2.5%
2010 – 2015	4.5%	0.9%	3.7%	0.7%

Revenues and congestion are linked, because the solution to both issues can be addressed simultaneously. A fair tax regime will not only ensure that the maintenance burden is spread fairly and guarantees sustainable long term funding but also manages overall demand and by pricing it accurately. The mileage component is a necessary component of any new tax regime, whether the one outlined in this paper or not. It is the only way to sustainably guarantee future revenues both for the government and

the road network. If road traffic was to begin reducing from 2017 onwards and revenues decreased, that would still be a benefit for the government, because less maintenance would be required on the road network and the economy would benefit from more reliable journey times. However, if (as expected) vehicle miles continue to increase in the UK then the government budget, and the road network is also guaranteed to reap the benefits of that increased economic

activity. The new tax regime will either reduce congestion or increase revenues in the medium-long term. Furthermore, this tax system will be ready when the public is open to the idea of active travel management, as mentioned in the section 4.1.

A good road taxation regime will also help decision makers on where and how to spend the capital investment funds of the transport budget. In the current system transport schemes compete for funding through having the most compelling business cases, including having the highest BCR (benefit cost ratio). This BCR is the outcome of modelling the traffic impacts of the scheme, and entering those outcomes to the Department for Transport's (DfT) Transport User Benefit Analysis (TUBA) software. A paradox consequence of the current fuel duty regime is that if a scheme alleviates congestion on a road it will have a negative impact on public finances: reduced congestion means less fuel consumption, which in turn reduces income from fuel duty. While decision makers are aware of this glitch and therefore can mitigate for it when making decisions, it does highlight the issue that in theory it ought not to be in the interest of the Treasury to reduce congestion on Britain's roads.

4. Guaranteeing funding for local infrastructure

Local roads bear 2/3 of all the traffic in the UK yet the 2016 budget saw a near 30% decrease in government spending on them, with some additional funds estimated for 2017, but a projected overall decrease by 17% by 2019 (see RAC Local Road Report and Table 2). The safety

implications are severe, because the majority of non-motorised user traffic uses on these local roads and they are much more vulnerable to poor surfaces than motorised users.

Table 2 Change In Government Spending On Local Roads
(See Appendix 2 For Source Of Calculations)

Change in Government spending on local roads compared to previous year (budget item CKETL)	
2016 actual	29.5%
2017 estimate	18.7%
2018 estimate	-3.1%
2019 estimate	2.5%
2015-2019 total change	-16.9%

Revenues and congestion are linked, because the solution to both issues can be addressed simultaneously. A fair tax regime will not only ensure that the maintenance burden is spread fairly and guarantees sustainable long term funding but also manages overall demand and by pricing it accurately. The mileage component is a necessary component of any new tax regime, whether the one outlined in this paper or not. It is the only way to sustainably guarantee future revenues both for the government and the road network. If road traffic was to begin reducing from 2017 onwards and revenues decreased, that would still be a benefit for the government, because less maintenance would be required on the road network and the economy would benefit from more reliable journey times. However, if (as expected) vehicle miles continue to increase in the UK then the government budget, and the road network is also guaranteed to reap the benefits of that increased economic

looking after our elderly population. If investment in local roads is constantly postponed, future generations will have to pay the price of it. Underinvestment in local roads will also hold back economic growth, which seems to be shifting towards online shopping and the home delivery, which is reliant on a high quality local network.

The supply side squeeze coupled with increasing demand for those last mile package deliveries ("white vans") mean that without policy intervention, the condition of local roads will deteriorate exponentially in the future. The online retail business model is producing negative externalities in the local residential areas where people live and children play or go to school. These negative externalities include:

- increased local road maintenance costs,
- growing congestion,
- increased greenhouse gas emissions, and
- worsening air quality.

The current tax regime is not able to get the online shopping business model to internalise these costs. Exacerbating the situation, 96% of vans tend to be diesel vehicles, amplifying their negative impact on local air quality (DfT - page 10). The new tax system needs to be able to tap into the rapid growth in online retail and manage demand for the road network by increasing the contribution of business users based on how much they use the road network. This will lead to rationalisation of deliveries by businesses and ultimately a reduction in local traffic.

Table 3 Change In Traffic On Major And Minor Roads (Based on table tra0102)

Change in road traffic: major vs minor roads	Major ⁴	Minor
1995 to 2000	9.7%	6.3%
2000 to 2005	6.7%	4.6%
2005 to 2010	-0.8%	-1.9%
2010 to 2015	5.1%	3.2%
TOTAL	20.8%	12.1%

As a measure to correct the current underinvestment in roads, the previous Chancellor of the Exchequer has promised to hypothecate VED to road investment from 2020 onwards (Parliament Library, 2016). However, this proposal would go to Highways England's Road Infrastructure Scheme fund, which invests solely in the Strategic Road Network (SRN) and not local roads. Part (20%) of the new road tax would be ring-fenced to be spent on maintenance of the entire road network, according to the traffic they bear (2/3 local and 1/3 SRN) and recent growth in traffic (see Table 3).

⁴ See footnote one about issues with this dataset.

The system would give the option to individuals to choose the Local Highway Authorities (LHA) that their contribution should go to (if not specified then they will go to the HLA where the car is registered). Additionally, if the driver has a telematics device installed, then the data from the device will be used to allocate their contribution to the HLAs of the roads they drive on. This will create a direct link between the tax burden of individuals and the pleasure and benefit of improving something that they see and use every day.

This effect cannot be underestimated, because it is one of the main factors of why people would be willing to pay for road pricing according to the [RAC study](#) (page 32). Hypothecation, in both budgetary and geographical form, is a fundamental aspect of the proposed new road tax. It gives users the confidence that what they are paying for in taxes is returned to them in some form. The former means that the revenue generated from road use is reinvested in infrastructure for road users, while the latter means that if the tax revenue is generated in Blackpool then it will be spent in Blackpool and not in London.

5. Improving road safety

Although the roads of the United Kingdom are amongst the safest in Europe, we can do much better. There were still [1,732 reported road deaths and 22,137 serious injuries](#) in 2015, which is exactly 1,732 more people dying and 22,137 more people suffering life-changing injuries than necessary ([DfT](#)). While autonomous vehicles might improve road safety in the long term, a more immediate solution is required. One particularly vulnerable user

group in this regard are young drivers under the age of 25. According to the [DfT](#) there were 1290 killed or seriously injured young drivers in 2013 ([DfT](#)). The economic value of preventing those collisions is estimated to be £2.9bn compared to the figure of £14.7bn for all drivers. Therefore, aiming to improve safety in this age group could yield better results than having a scattered approach.

Furthermore, a general grievance by rule-abiding motorists is that there seems to be little enforcement for the Highway Code. If the new road tax regime can hypothecate a small part (0.5- 1%) of its revenues for funding improved emergency services (police, ambulance, fire services, highway traffic managers) then that could address both collision prevention and mitigation. This could also prove to be popular with the quiet majority of road users despite the possibility of strong objections by a loud minority.

According to Marmalade, a specialist telematics insurance provider, only 6.25% of their young drivers have an accident within the first 6 months of passing their test compared to 20% across all young drivers⁵. Telematics insurance policies are becoming ever more popular: they grew from 12,000 in 2009 to 750,000 policies in 2016 ([BIBA](#)). This growth is largely due to telematics insurance premiums being approximately 25% cheaper than their traditional counterparts.

⁵ Whether this correlation between safety and telematics is caused by telematics or is accidental (because people who are willing to put telematics in their car are safer drivers in general) is yet to be seen, but the evidence by BIBA for the correlation seems convincing.

Young drivers are particularly price sensitive (due to all the costs they face in obtaining a licence, purchasing their first vehicle and then having to insure it as well), therefore a further reduction in price could accelerate the market share of telematics insurance policies.

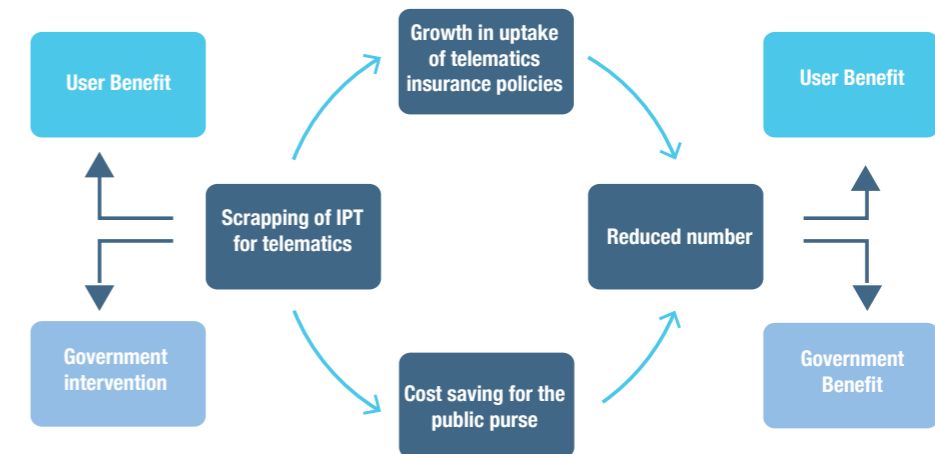


Figure 2 Potential Benefits Of Government Intervention In The Young Drivers Insurance Market

The policy intervention is outlined in Figure 2 and it consists of the removal of Insurance Premium Tax on telematics policies for young drivers. Drivers would benefit from paying less to be able to drive their first car, but also there could be behavioural change to improve driving standards via the insurance company's feedback to drivers. Additionally, both the government and the public would benefit from the reduced number of road traffic collisions.

5. Hypothecation and financial viability

Fuel duty contributed approximately £27.2bn, VAT on fuel duty another £5.4bn, and VED

£5.9bn, to the UK's budget in 2015 as shown in Appendix A Government Revenues from Fuel Duty and VED and Traffic on UK roads (1990-. Exact figures for VED collection costs were inaccessible; nevertheless they should cover both the 0.002% margin of insurance companies as well as the cost of advising insurance companies in the transition period of the introduction of the new tax. Checking insurance companies' accounting is

already carried out to supervise income from the IPT). The total revenue that the new road tax would need to raise in order to be revenue neutral is approximately £38.4bn.

As mentioned in section 4.4 the new road tax would include a partial (20%) hypothecation of revenues. This fund would guarantee the sustainability of both local roads and the SRN. The ring-fenced revenue would be allocated between Highways England and LHAs largely following traffic

levels on the road network. Furthermore, if a tax-payer has a telematics device fitted, then their hypothecated contributions can be split proportionately according to the roads on which they drive. This would allow the estimated £3bn funding gap for local roads to be filled (RAC, [Local Roads](#), page 13).

In 2015 £4.1bn was spent on national (£3.7bn – CKETN) and local roads (£0.4bn – CKETL) combined by the central government (Appendix B 2015 and 2016 UK Budget (£bn) and Treasury Forecasting 2017-2019). The amount spent by all LHAs is approximately £3.4bn (PTEG, 2013). With the introduction of the new road tax the combined LHA and national government pot would grow to approximately £7.68bn (20% of all revenues), which is largely in line with current spending. The main difference would be that LHAs would spend £3.4bn less from their own budget whereas central government would spend that much more. To ease the base year shock on the government budget, a gradual approach could be introduced, which would increase the spending up to the 20% hypothecation levels gradually (over 3-5 years).

However, in future years the funding gap that the government experienced in the base year will gradually reduce, because 80% of revenues from increasing traffic volumes would go to the Treasury and only 20% towards the maintenance of the road network. Furthermore, the collection and enforcement of fuel duty, which costs approximately £54mn (0.2% of revenues according to the RAC, [Road Pricing](#), page IX), would constitute a saving in its entirety and could be used to mitigate the impact of the new tax on the

businesses in the transitional period of the introduction of the tax.

A benefit of this arrangement is that most people view LHAs as more accessible and accountable than central government (RAC [Road Pricing](#), page 35). LHAs could plan their maintenance work and forecast future revenues based on traffic growth. The central government would not need to worry any longer about which LHA to allocate road investment grants to. The LHAs would become financially independent and would be forced to act more commercially, without the expectation of central government aid in case of need. Furthermore, key indicators such as those used for HE's RIS can be developed and applied to monitor LHAs spending.

In sum, the currently declining overall budget revenues caused by the shift away from hydrocarbon fuels would be reversed and guaranteed for the near future and the long term. Freely available revenues (non-hypothecated revenues) would decrease by approximately £3-3.5bn in the short term but pick up and grow in line with traffic in the long term. Overall budget revenues would remain the same even in the short term (since the change would be revenue neutral). Hypothecation would mean that overall, approximately £3-3.5bn additional investments would go into the road network mainly to LHAs. Finally, an increase in traffic demand would lead to increased funding for the road network, which could fuel the upward cycle of economic growth centred on the road.

6. Stakeholder Engagement and Objections

1. Privacy

Privacy will likely be the biggest source of objection. For the successful marketing of the new road tax, it is imperative that the public understand that telematics devices will never, ever be compulsory. An entirely self-declared mileage based taxation will always be there as an alternative.

Telematics devices are only for the convenience of those who prefer using them, such as younger drivers. People are already using these as part of their insurance policies and most insurance companies are seeking to educate the public through “myth busting”. These types of policies would bring additional convenience to the individual just as to the government. Furthermore, younger generations seem to be less privacy focussed and more convenience focussed and as such would be more likely to take up the telematics based method of paying road tax.

The real benefit of the new road tax system is that no more data would be collected from individuals than what insurance companies already hold about them. The insurance companies already have to ensure that they store data in a safe manner; therefore there would not be any costs in setting up additional secure databases. In the case of any dispute, the Information Commissioners Office would be the ultimate arbiter. However, there should be an opt-out for those who do have privacy concern for a slight premium.

2. Special Needs Exemptions

The new road tax regime would include generous discounts (50-75%) to blue badge holders, who are reliant on their cars. This would lead to substantial savings for these users, who previously would have had to pay fuel tax.

3. Non – compliance: Under-declaring mileage

This is an important part of the functionality of the tax regime for all those who will prefer to self-declare their mileage instead of using a telematics device. However, there is already a protocol in place for those who have inaccurately predicted their annual usage. They can call their insurer and request to have an extension to their mileage limit subject to a revised payment. The road tax would be dealt with alongside the insurance through the same mileage rate as the original annual mileage. To ease future years, estimated mileage would be calculated based on previous years unless there was a change of circumstances.

The greatest deterrent for malevolently under-declaring mileage is that when involved in a collision or otherwise found out by the insurance companies (who themselves incentivised to check on this) then their insurance will be void and users will have to pay a penalty. Furthermore, the existing yearly MOT system, which checks for the road-worthiness of vehicles also checks for mileage, data from which can be made available to insurance companies to cross reference individual vehicles.

Such non-compliance would lead to prosecution for both insurance fraud and tax evasion. If on the other hand drivers over-declare mileage, this can be resolved by taxpayers getting a refund or writing off their overpayment from their next year's balance.

4. Non – compliance: Uninsured drivers

There is an estimated 1 million uninsured cars in the UK, while only half a million unlicensed cars according to the DfT ([Callwiser](#) and [DfT](#)). In this measure vehicle registration seems to get higher compliance levels than third party insurance. However, with the additional hypothecated revenue funding to the police for enforcement it should be possible to bring down the level of non-compliance. On the prevention side, many of those involved in uninsured collision claims are under-

30. With the option of cheaper telematics insurance policies for those under 25, it might be possible to reduce the levels of uninsured drivers on the road, which would bring additional benefits to both the insurance industry and the general public. However, it is also true that many people will continue to cut corners. This should be tackled by better and more innovative information campaigns and a possible tightening of the sanctions surrounding uninsured driving⁶.

5. Non – compliance: Vehicle mileage adjustment

Along with uninsured drivers, car-clockers are a further challenge to the feasibility of the tax regime ([BBC](#)). The first solution

would be to prosecute companies who offer and individuals who purchase the service of reducing the mileage on the odometer of cars. Secondly, these legal changes would need to be advertised very clearly for all car owners to know. Just like the issue of uninsured drivers, it is unlikely that many car owners would risk breaking the law, particularly if they found that the new tax regime would be fairer than the previous one. Finally, if they did break it, it is more likely that they would choose to drive uninsured, which does not involve a transaction with a third party like adjusting the odometer does.

6. Non – compliance: “I wasn't the driver”

Some might object or refuse to pay the new road tax on the grounds that they are not the ones driving the car. Under the current VED system it is the keeper of the car who is responsible for taxing the vehicle; this would not change under the new road tax. It is the keeper, who is responsible for taxing as well as insuring the vehicle. If the vehicle is off the road, then the existing Statutory Off Road Notification (SORN) notice could be applied.

Additionally, it can be expected that whoever is driving the keepers' car is doing it with their consent. From this it follows that the financial matters can be settled between them, as the driver will know the rate per mile of his or her vehicle. Likewise, if it is a business user or part of a car fleet, the rate per mile will make it very clear how much the actual driver should be charged by the owner of the fleet.

⁶ Current sanctions can be considered very lenient, at a £600 fine and 6 points on the licence ([GOV.UK](#)).

Finally, if the vehicle is used without the user's consent (e.g. it has been stolen) then the insurance company will be able to take either a pro-rata refund of the unused mileage or transfer it to the new car just as they do with insurance. If the owner of the vehicle has a telematics device the insurance company will be able to stop payments until the car is recovered or a new one purchased.

7. Resistance from businesses

It is expected that business users, particularly delivery companies and online retail businesses will pose resistance since they are expected to guard their profits. However, online retail is a strongly growing business model and is taking over large parts of the retail market. As explained in Section 4.4, they are expected to internalise some of the negative externalities produced by their business model.

Additionally four separate points can be made to address their concerns:

- Reduction in congestions stands to benefit business users more than the public, because businesses' value of time is greater than the general public's.
- Improved local road quality will also benefit business users through reduced car maintenance costs.
- Scrapping fuel duty will give businesses immediate savings. Furthermore, delivery businesses already have the benefit of using the roads mostly in the inter-peak and off- peak periods, which discount their road tax if they have telematics fitted.
- This initial challenge for business users

will eventually be overcome, because companies that can innovate fastest in consolidating parcels and their deliveries into smaller units will gain an additional competitive advantage.

Finally, politically it seems reasonable to expect that online-only retailers, which at present have reduced contribution to the public purse (by not having to pay business rates based on property values), should contribute more to the infrastructure, which they do rely on for their business model to work.

8. Sales of Alternative Fuel Vehicles will decrease

While this consequence is possible it is not likely. Fuel will still be a large part of the expenditure of car owners and it is likely to go up in future years. With fuel prices around £3/gallon (66p/litre) without fuel duty and annual fuel consumption being at 283 gallons per vehicle, the fuel bill would still be at approximately £850 a year. Finally, under the new road tax system AFVs without harmful emissions would pay substantially less, thereby bringing additional savings to their owners.

7. Marketing Strategy of the New Road Tax

To win public support for the proposals the marketing has to emphasise the intervention's revenue neutrality and the scrapping of VED and fuel tax. The second most important marketing tool will be the emphasis on financial and geographical ring-fencing and investment of 20% of each individual's contribution. The third key message needs to be on the convenience of the new regime, because users won't need to bear any additional practical burdens, simply renew their insurance and pay their road tax bill on one go. The marketing will also need to emphasise that no additional data will be collected on anyone apart from what insurance companies already hold on car owners.

Below is a further list of key messages which can help to gain support for the scheme:

- The average household will be a few hundred pounds better off
- Young drivers who chose to have telematics will see their premiums reduced by 12%
- All the benefits available by opting for a telematics insurance
- The scheme is going to improve air quality
- Previously free-riding vehicles not registered in the UK will be taxed as well
- "White vans" will have to contribute more, since their business model produces negative externalities for local residents.

8. Conclusion

In sum, the new road tax system maintained by insurance companies would be fairer for all road users, because those who use the roads most with heavier vehicles would contribute more than those who use it less with lighter ones. It would be good for the environment, because it would discourage buying and using more pollutant vehicles (such as diesels) particularly if they are used frequently and for long distances. It would be good for the economy, because it would guarantee that a part (20%) of the revenues from the new road tax would be reinvested in the local road network where the user generated those revenues in the first place.

The ring-fencing would fund better roads, because with a net spending increase of £3.6bn would reduce the maintenance backlog of the local highway network. Money invested in the local highway network would bring large safety benefits, because the vast majority of cycling and pedestrian traffic is on the local highways and they are much more exposed to poor road surfaces than motor vehicles. The reduction in the price of telematics insurance policies for young drivers will lead to a greater uptake in those policies, which should also contribute to accident reductions for that vulnerable age group and therefore contribute to safer roads overall.

Furthermore, eventually drivers might be convinced by the convenience of having a telematics device and being able to pay-as-they-went their road tax. When that occurs there will be a possibility implement wider ranging

demand management measures, which could eventually reduce congestion and improve Journey Times in the long term. In an uncertain future a system, which resolves all current issues, is inexpensive to implement and can be adapted future to technological change can be the best possible choice.

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Appendix A Government Revenues from Fuel Duty and VED and Traffic on UK roads (1990-)

Year	GDP (bn)	(CCUDG) Fuel duties (bn)	% of GDP	% change on previous year	GDP share growth	VAT on fuel duty (bn)	% of GDP	% change on previous year	GDP share growth	Total VED (bn)	% of GDP	% change on previous year	% gdp share change	Vehicle miles driven (bn)	% change on previous year
1990	£ 570	£ 8.7	1.5%	0.6%	-7.4%	£ 1.7	0.3%	0.6%	-7.4%	£3.0	0.5%	7.4%	-1.1%		
1991	£ 599	£ 9.6	1.6%	10.3%	5.0%	£ 1.9	0.3%	10.3%	5.0%	£2.9	0.5%	-0.8%	-5.6%		
1992	£ 622	£ 11.0	1.8%	14.3%	10.1%	£ 2.2	0.4%	14.3%	10.1%	£2.9	0.5%	-0.4%	-4.1%		
1993	£ 654	£ 11.4	1.7%	4.0%	-1.1%	£ 2.3	0.3%	4.0%	-1.1%	£3.3	0.5%	11.3%	5.8%	256.2	
1994	£ 693	£ 12.7	1.8%	11.4%	5.1%	£ 2.5	0.4%	11.4%	5.1%	£3.6	0.5%	11.2%	4.9%	261.9	2.22%
1995	£ 733	£ 14.3	1.9%	11.9%	5.8%	£ 2.9	0.4%	11.9%	5.8%	£3.8	0.5%	6.0%	0.2%	267	1.95%
1996	£ 782	£ 15.7	2.0%	10.0%	3.1%	£ 3.1	0.4%	10.0%	3.1%	£4.0	0.5%	4.4%	-2.1%	274.1	2.66%
1997	£ 830	£ 17.2	2.1%	9.5%	3.2%	£ 3.4	0.4%	9.5%	3.2%	£4.2	0.5%	3.7%	-2.3%	279.8	2.08%
1998	£ 879	£ 19.5	2.2%	13.3%	7.0%	£ 3.9	0.4%	13.3%	7.0%	£4.5	0.5%	6.8%	0.8%	284.9	1.82%
1999	£ 929	£ 21.6	2.3%	10.8%	4.8%	£ 4.3	0.5%	10.8%	4.8%	£4.6	0.5%	3.8%	-1.8%	290.2	1.86%
2000	£ 976	£ 22.5	2.3%	4.5%	-0.6%	£ 4.5	0.5%	4.5%	-0.6%	£4.9	0.5%	5.1%	0.0%	289.7	-0.17%
2001	£ 1,022	£ 22.6	2.2%	0.5%	-4.0%	£ 4.5	0.4%	0.5%	-4.0%	£4.3	0.4%	-12.1%	-16.0%	293.7	1.38%
2002	£ 1,075	£ 21.9	2.0%	-3.2%	-7.9%	£ 4.4	0.4%	-3.2%	-7.9%	£4.3	0.4%	0.5%	-4.4%	300.6	2.35%
2003	£ 1,139	£ 22.1	1.9%	1.1%	-4.6%	£ 4.4	0.4%	1.1%	-4.6%	£4.3	0.4%	1.0%	-4.6%	302.4	0.60%
2004	£ 1,202	£ 22.8	1.9%	2.9%	-2.5%	£ 4.6	0.4%	2.9%	-2.5%	£4.7	0.4%	8.1%	2.5%	306.9	1.49%
2005	£ 1,254	£ 23.3	1.9%	2.3%	-1.9%	£ 4.7	0.4%	2.3%	-1.9%	£4.7	0.4%	1.0%	-3.2%	306.9	0.00%
2006	£ 1,329	£ 23.4	1.8%	0.5%	-5.1%	£ 4.7	0.4%	0.5%	-5.1%	£5.0	0.4%	4.5%	-1.4%	311.4	1.47%
2007	£ 1,406	£ 23.6	1.7%	0.6%	-4.9%	£ 4.7	0.3%	0.6%	-4.9%	£5.1	0.4%	3.8%	-1.9%	314.1	0.87%
2008	£ 1,434	£ 24.9	1.7%	5.6%	3.5%	£ 5.0	0.3%	5.6%	3.5%	£5.4	0.4%	4.9%	2.9%	311	-0.99%
2009	£ 1,394	£ 24.6	1.8%	-1.2%	1.7%	£ 4.9	0.4%	-1.2%	1.7%	£5.6	0.4%	3.5%	6.5%	308.1	-0.93%
2010	£ 1,501	£ 26.2	1.7%	6.4%	-1.2%	£ 5.2	0.3%	6.4%	-1.2%	£5.7	0.4%	1.7%	-5.6%	303.2	-1.59%
2011	£ 1,575	£ 27.3	1.7%	4.0%	-0.8%	£ 5.5	0.3%	4.0%	-0.8%	£5.8	0.4%	1.7%	-3.1%	303.8	0.20%
2012	£ 1,629	£ 26.8	1.6%	-1.7%	-4.9%	£ 5.4	0.3%	-1.7%	-4.9%	£5.9	0.4%	2.4%	-1.0%	302.6	-0.39%
2013	£ 1,678	£ 26.6	1.6%	-0.8%	-3.7%	£ 5.3	0.3%	-0.8%	-3.7%	£6.0	0.4%	1.2%	-1.7%	303.7	0.36%
2014	£ 1,756	£ 26.9	1.5%	1.2%	-3.3%	£ 5.4	0.3%	1.2%	-3.3%	£6.1	0.3%	2.0%	-2.6%	311.6	2.60%
2015	£ 1,833	£ 27.2	1.5%	1.0%	-3.2%	£ 5.4	0.3%	1.0%	-3.2%	£5.9	0.3%	-3.5%	-7.5%	316.7	1.64%
2016	£ 1,875	£ 27.5	1.5%	1.3%	-1.0%	£ 5.5	0.3%	1.3%	-1.0%	£5.6	0.3%	-5.0%	-7.1%	320.5	1.20%
2017	£ 1,943	£ 27.6	1.4%	0.4%	-3.1%	£ 5.5	0.3%	0.4%	-3.1%	£5.5	0.3%	-1.8%	-5.2%		
2018	£ 2,021	£ 27.8	1.4%	0.7%	-3.2%	£ 5.6	0.3%	0.7%	-3.2%	£5.7	0.3%	3.6%	-0.4%		

Sources: DfT and <http://www.ukpublicrevenue.co.uk/>

Appendix B 2015 and 2016 UK Budget (£bn) and Treasury Forecasting 2017-2019

Year	GDP (bn)		(CCUDG) Fuel duties (bn)		% of GDP		% change on previous year		GDP share growth	
--Transport	£ 20.29	a	£ 26.29	e	£ 28.26	g	£ 29.40	g	£ 29.95	g
--Other transport (CKEOT)	£ 1.17	a	£ 1.70	a	£ 2.48	e	£ 3.20	e	£ 4.31	e
--Railway (CKERL)	£ 4.94	a	£ 11.33	a	£ 11.55	e	£ 11.19	e	£ 9.60	e
--Local roads (CKETL)	£ 0.35	a	£ 0.25	a	£ 0.29	e	£ 0.28	e	£ 0.29	e
--National roads (CKETN)	£ 3.71	a	£ 3.89	a	£ 4.16	e	£ 4.34	e	£ 4.74	e
--Local public transport (CKETP)	£ 0.51	a	£ 0.53	a	£ 0.57	e	£ 0.57	e	£ 0.59	e
--Transport (capital) (LCTRA)	£ 4.64	a	£ 4.75	e	£ 4.86	g	£ 4.98	g	£ 5.10	g
--transport (current) (LKTRA)	£ 3.45	a	£ 3.79	e	£ 4.17	g	£ 4.58	g	£ 5.04	g
--London Underground Limited (PCLLU)	£ 1.47	a	£	a	£ -	e	£ -	e	£ -	e
--Northern Ireland Driver and Vehicle Testing Agency (PCNDA)	£ -	a	£	a	£ 0.01	e	£ 0.03	e	£ 0.03	e
--Northern Ireland Public Trust Port Authority (PCNPA)	£ 0.02	a	£ 0.02	a	£ 0.07	e	£ 0.08	e	£ 0.05	e
--Northern Ireland Transport Holding Company (PCNTH)	£ 0.04	a	£ 0.04	a	£ 0.11	e	£ 0.14	e	£ 0.20	e
--Total Transport (PCTRA)	£ -	a	£ -	a	£ -	e	£ -	e	£ -	e

Legend:

- a actual outturn
- e estimate in HM Treasury 2016 budget
- g 'guesstimated' projection by ukpublicspending.co.uk Source: <http://www.ukpublicspending.co.uk/>





WOLFSON
ECONOMICS PRIZE
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Policy
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