Road Pricing and the Environment:
A Discussion Paper from IEEP

Introduction

Currently the Government plans to introduce a universal road pricing system within the next decade or so. The principal aim of such a system would be to tackle congestion by suppressing road traffic or diverting it away from the most congested times and places. To do this it can be anticipated (for the purposes of this paper) that the scheme will differentiate charges according to the propensity for the road used to be congested (reflected in the time and place of travel, and possibly some indicator of actual road conditions) and for the propensity of the vehicle travelling to add to congestion (ie possibly some measure of the footprint of the vehicle).

While each of these measures is to one extent or another a proxy for certain environmental characteristics, they are not particularly good ones, so it cannot be taken for granted that tackling congestion will automatically tackle other environmental (or indeed social) ills at the same time. On the contrary, some particular concerns about the possible unintended consequences of a ‘congestion-only’ road charging scheme have already been raised, including those outlined in the next section. In contrast the 2004 feasibility study indicated that environmental benefits might well be attached to a road pricing scheme; this paper briefly outlines some of the features that might be incorporated into the pricing system in order to bring about such benefits.

Note: This paper is written as a short discussion paper. It intentionally does not make extensive reference to scientific evidence, and in a number of places ventures expert opinions on matters where scientific evidence is as yet unavailable or far from conclusive. Hence some of the statements made are intended as propositions for debate, not established facts, and it is stressed that more detailed analysis would be needed if any of the options outlined here were to be actively pursued.

Potential Unintended Consequences of ‘Congestion-Only’ Road Charging

With road pricing applied primarily to congested urban and inter-urban roads, the environmental consequences in the vicinity of these roads is likely to be broadly positive. In other areas, however, it is likely that net costs of travel would fall, and this could induce a ‘rebound effect’ that would be likely to have adverse environmental consequences. Some particular aspects of this are highlighted below.

Carbon Dioxide Emissions

Earlier work in which the author was involved for IPPR referred to congestion charge modelling from Imperial College, which used the same assumptions as the

1 Putting the Brakes on Climate Change: A policy report on road transport and climate change, J Foley and M Fergusson, ippr, 2003
NTM for the fuel efficiency of vehicle fleets, fuel price and traffic growth in the period to 2010. The report goes on to argue that, whilst a revenue neutral charge would help to redistribute traffic and ease pressure on congestion hot spots, it would not necessarily lead to an overall decrease in traffic levels or CO₂ emissions. On the contrary, given that the Government expects the real costs of motoring to continue falling, it went on to argue that it does not make sense to introduce congestion charging on a revenue neutral basis as it would cause the price of fuel to fall still further, and the combination of declining motoring costs and rising personal incomes means that a revenue neutral charge could well worsen overall traffic levels and CO₂ emissions.

The result could be a net increase in CO₂ emissions, in both relative and absolute terms, that would violate any reasonable interpretation of DfT’s commitments under the PSA on climate change. As well as this direct impact, price signals to encourage purchase of more efficient vehicles would also be weakened, thereby further threatening the achievement of the cleaner vehicle targets in Powering Future Vehicles.

**Air Quality**

In urban centres that are currently congested, it is quite possible that the impact of congestion-only pricing would be positive, in that it might depress aggregate traffic levels and improve the flow and hence the efficiency of the traffic that remained. Elsewhere, however, likely impacts are less clear-cut. There could for example be adverse air quality impacts in other parts of urban areas, and the likely effect of diversion of traffic to other areas upon regional pollutants such as ozone is extremely difficult to predict.

**Traffic in Rural Areas**

Charges on uncongested rural roads would be expected to be quite low under a ‘congestion-only’ scheme, so if the cost to the motorist of road charging were to be significantly compensated by a reduction in road fuel duty, then the marginal cost of rural motoring would fall significantly. This might be seen as a benefit for the ‘rural poor’, but our research² on this point has highlighted that, even in rural areas, where poorer people are indeed more likely to own cars, it still tends to be the rich who drive the farthest, while many of the poorest still remain without cars and are dependent on scant public transport services or lifts from friends and relatives. There is no obvious reason to suppose that road charging would significantly improve this situation – indeed it might as easily exacerbate it.

The net result would be likely to be a substantial increase in rural traffic. Coupled with the major development pressures already posed by the Government’s ‘Sustainable Communities’ policy, this could arguably be the last nail in the coffin of rural tranquillity – and indeed could fundamentally affect the very nature of our rural areas – in the south-eastern half of England at least. Other attendant problems might

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² *Transport Taxation and Equity*, M Fergusson and I Skinner, IPPR, 1998
include an increase in accidents on what are already amongst the most dangerous road types, especially for vulnerable users.

**Traffic on Unsuitable Roads**

A related problem would be the diversion of traffic from heavily-used (and hence highly-charged) major roads onto other less suitable (but cheaper) ones. The latter could include parallel roads, urban ‘rat runs’ and rural cross-country routes. Here higher traffic levels would cause a range of problems, with heavy goods vehicles presenting particular issues if they switch to roads that are markedly less well suited to them. The adverse results would be likely to include more accidents, more road damage and more disturbance in rural and urban residential areas alike.

As discussed below, however, it should be possible to address at least some of these issues through the design of the road charging system, and to deliver positive environmental and social as well as economic benefits – i.e the ‘win-win-win’ scenario.

**Environmental Impacts and Road Charges**

The table which follows presents a non-exhaustive list of the environmental and other adverse impacts associated with road traffic and (in the latter case) new roads. It also indicates what would be likely to be the effect of a congestion-only approach to road charging, and conversely how charges might be additionally differentiated either to avoid environmental problems or to achieve environmental gains.

In a paper of this length it is not possible to discuss the question of internalising external environmental costs in any detail. However, it can be said that this approach of differentiating charges in line with environmental characteristics (or proxies for environmental characteristics) is consistent with the internalisation approach, and could be calibrated to reflect external costs in cases where these are reasonably well known.

<table>
<thead>
<tr>
<th>Environmental Issues/Impacts</th>
<th>Effect of Congestion-only Charge</th>
<th>Opportunities to Differentiate by Vehicle Class</th>
<th>Opportunities to Differentiate by Road/Area Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fuel consumption/CO₂ emissions/climate change</td>
<td>Slightly +ve or neutral if additional to current taxes; but strongly –ve if revenue-neutral</td>
<td>Vehicle weight class for HGVs; CO₂ emissions or VED class for LDVs</td>
<td>? higher on congested or high-speed roads</td>
</tr>
<tr>
<td>Pollutant emissions/air quality in sensitive areas</td>
<td>Probably slightly +ve in urban centres; possibly –ve elsewhere</td>
<td>Euro emissions standard and vehicle/fuel class</td>
<td>AQMAs; urban centres; other sensitive areas eg SSSIs</td>
</tr>
<tr>
<td>Noise</td>
<td>Mixed – possibly +ve in urban areas, –ve on high speed roads</td>
<td>Vehicle weight class; NB higher for small motorbikes and scooters</td>
<td>Higher in sensitive areas (eg National Parks and tranquil areas) and residential areas (especially at night)</td>
</tr>
<tr>
<td>Visual intrusion</td>
<td>Mixed – at least some –ve effects from</td>
<td>Vehicle size or weight class*</td>
<td>Higher in sensitive areas (eg National Parks and</td>
</tr>
</tbody>
</table>

*Note: Vehicle size or weight class*
Priority Environmental Issues for Road Charging

If it is not possible for road charging to address all environmental ills, though, there are arguably three areas where either the seriousness of the potential problems, or the size of the opportunity available, merit priority consideration.

Fuel Consumption and CO₂ Emissions

As argued above, a revenue neutral implementation of road pricing would almost inevitably require a significant reduction in fuel duty and possibly VED as well. Reduced fuel duty would almost certainly lead to an immediate increase in CO₂ emissions. As well as this direct impact, price signals to encourage purchase of more efficient vehicles would also be weakened. It is imperative that this be avoided, inter alia by considering the following options:

- Retaining fuel duty at significant levels, and also significant differentiation of VED or a replacement ‘feebate’ scheme;
- Considering linking the charging bands for cars to other existing CO₂ taxation mechanisms for vehicles; most obviously the graduated VED scheme or possibly the company car tax bands.
Diversion onto Unsuitable Roads

This is in danger of being a significant and very apparent problem in both rural and urban areas, and could threaten acceptance of the scheme. Problems might relate to the general level of traffic, or to particular classes of vehicle. To address these two issues, particular attention might be paid to the following possibilities of road pricing:

- Sufficiently high charges to deter HGVs in particular from travelling long distances on minor roads, especially where a main road alternative is available.
- Sufficiently high charges to deter HGVs from using residential roads, especially outside working hours.
- Charges differentiated to manage traffic levels in sensitive areas such as national parks and AONBs. These too might be differentiated according to vehicle class, for example to discourage HGVs or motorcycles.
- Sufficiently high charges to cap traffic levels in bottleneck areas where damaging new road schemes would otherwise be needed.

Air Quality Management

It is suggested above that congestion-only road pricing might have a positive effect on local air quality in some urban centres and is unlikely to have a significantly adverse one overall. There could however be new problems in some areas.

However, this is against a background in which many local authorities are experiencing serious difficulties in establishing effective policies to reduce exceedances of limit values in AQMAs, arguably because they lack sufficient tools to address the all-important effects of road traffic. For example, it can be argued that the proposed Low Emission Zone for London is likely to experience difficulties with enforcement; will have limited benefit because of its limited scope; and may well prove costly relative to the benefit that can be achieved.

In contrast, universal road pricing provides an unparalleled opportunity to address these problems in new ways. The following possibilities in particular should be highlighted:

- Higher charges could be considered in AQMAs, especially during commuting and working hours.
- A general differentiation of charges according to emissions class should be considered for vehicles in urban centres, in order to incentivise cleaner vehicles and possibly alternative fuels.
- Pre-catalyst cars and the oldest diesels in all classes are now in their ‘teens’ or older, and are also the classes most likely to fall under the ‘gross polluter’ heading. Therefore discriminatory pricing in urban areas could have a particularly strong effect in forcing them out of towns, into low-mileage uses, or onto the scrapheap, probably bringing disproportionately large environmental benefits.

Conclusions
The ‘congestion only’ approach to road pricing presents certain environmental risks that, if unaddressed, could seriously undermine the acceptability of any such system. Conversely, road pricing offers the possibility of addressing certain difficult environmental problems in a new and more sophisticated way. In either case, an initial assessment suggests that there are practical ways in which charges might be differentiated in order to achieve an environmentally more desirable outcome. If so road pricing should be an opportunity, not a threat, to the environment.

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