

# What Behavioural Science can tell us about Road Pricing

## Prepared by Beyond Logic Consulting for the Zero Emission Vehicles and Road Pricing Inquiry

### Summary

This paper has been produced in response to the call for evidence for the Zero Emission Vehicles and Road Pricing Inquiry and explores some of the insights from Behavioural Science in relation to the successful introduction of road pricing. It is most applicable to answering the question – *what needs to be considered in the development of any road pricing scheme*. On this basis, four key success factors for a successful road pricing scheme are:

1. A scheme which is fair and seen to be fair, so the price reflects the true cost of the trip but also the availability of realistic alternatives. This means a distance based system with varying pricing levels depending on when and where the journey is made. This fairness principle would need to include transparency over what happens to the revenue collected and this might be achieved by the revenue going into a “green roads fund” aimed at supporting green alternatives to single occupancy, polluting vehicles, while also providing a fund for repairing potholes and other repairs and improvements.
2. Citizen involvement in the design of the scheme and particularly payment options, how pricing levels vary, the overall revenue collected and how this changes over time (i.e. it would probably be more acceptable if the total revenue collected started low and then escalated in line with the improvement of alternatives).
3. An effective communications and information programme to ensure buy-in to the scheme is achieved and opposition is minimised.
4. Use of technology to make the driver interface with the scheme as easy as possible. This will almost certainly require a phased introduction to minimise the risk.

### Introduction

For the Zero Emission Vehicles and Road Pricing Inquiry written evidence has been sought regarding road pricing and:

- The case for introducing some form of road pricing and the economic, fiscal, environmental and social impacts of doing so;
- Which particular road pricing or pay-as-you-drive schemes would be most appropriate for the UK context and the practicalities of implementing such schemes;
- The level of public support for road pricing and how the views of the public need to be considered in the development of any road pricing scheme.

This paper examines these questions through the lens of Behavioural Science, with the aim of helping to ensure that if road pricing is introduced it is done so in a manner which optimises its effectiveness and minimises the opposition to it.

The remainder of the paper is structured as follows. Firstly there is a short introduction to the author of the paper, followed by an equally short introduction to Behavioural Science. The main body of the paper is a summary of some of the key behavioural concepts or principles which are relevant to road pricing. Finally, some selected references have been included.

### **About the author**

Tony Duckenfield has over thirty years experience of working in transport and is currently a Director of [Beyond Logic Consulting](#) specialising in the application of behavioural science. He has been seconded to Transport for London and the Department of Transport a number of times, including to help provide evidence to the Roads Task Force. Between 2001 and 2008 he was responsible for monitoring the business and economic effects of London Congestion Charging as Project Director at Steer. He has also been involved in road pricing studies for Cambridgeshire County Council and Leeds City Council, and was employed as an expert advisor on TDM (Transportation Demand Management) measures by Translink in Vancouver Canada. His conference papers include: "Just How Unpalatable is Road Pricing?" (4th Transport Practitioners Meeting, 2006), with published articles also on topics concerning behavioural economics and electric vehicles.

### **Behavioural Science**

Behavioural Science (or Behavioural Economics) has developed to explain differences between observed and predicted behaviour. Its roots can be traced back to 1759 and Adam Smith's *The Theory Of Moral Sentiments*, but more recently has been utilised by the Behavioural Insights Team as well as a variety of private sector consultancies to help behaviour change initiatives.

It is not a single unified theory but a set of in excess of 100 evidence based concepts (or "cognitive biases") which describe how people process information and make decision. It draws from a range of disciplines including experimental economics, psychology, sociology and neuroscience, and for this reason is often referred to as Behavioural Science, though was originally known as Behavioural Economics.

## Behavioural concepts and their implications for road pricing

A selection of the most relevant behavioural concepts is summarised in Table 1 and are discussed subsequently in terms of their implications for road pricing.

**Table 1: Key behavioural concepts**

Behavioural concept	Short description
Ambiguity aversion	People don't like ambiguity and seek clarity and simplicity.
Blame avoidance	Where the imperative is to avoid blame.
Easy	People are generally looking to make their lives easier and reduce the hassle factor. Simplicity and convenience are therefore key, and to facilitate a behaviour any friction should be reduced.
Fairness (or inequity aversion)	People don't like inequity and unfairness.
Framing (also Anchoring, Choice Architecture)	Choices are heavily influenced by the way they are presented and, for example, which (and how many) options are shown.
Habit	Most behaviour is habitual with minimal conscious thought. This creates inertia and puts a brake on change. It means that it is easier to change behaviour at a point when habits are interrupted.
Herd behaviour	The tendency for people to unconsciously follow what others are doing rather than act independently.
Loss aversion	People are more affected by losses than gains.
Messenger	The impact of a message can be as much about the messenger as the message itself.
Present bias (also hyperbolic discounting or short termism)	Things occurring imminently are given far more importance than those occurring in the future.
Primacy of emotion	Brain scanning has shown that our emotions are triggered in advance of rational thought and there is good evidence that emotions drive decision-making with conscious thought mainly about rationalising decisions which have already been made.
Relativity	People think in relative rather than absolute terms.

Source: Beyond Logic Consulting (<https://www.beyondlogicconsulting.com/>)

### *Ambiguity aversion*

People like clarity and this will present a challenge for a smart road pricing scheme which is sensitive enough for the price to reflect the real costs, which are inherently highly variable. However, there are lessons that can be learnt from other products and services, such as mobile phone and home energy services. It will be important to recognise this concern and to address this by providing clarity on how the price of road use is calculated, what it is going to be ahead of making a journey, plus a simple way of

keeping track of how much they are paying, and how they can reduce their costs.

### *Blame avoidance*

The effect of Blame avoidance is that drivers will tend to underplay their own impact of car use and overplay the necessity of their car journeys. This effect was demonstrated by the Central London Congestion Charging scheme with many drivers ahead of its introduction not acknowledging that they were part of the problem or that they had good alternatives to car.

To support a new road pricing scheme a communications and information programme will be needed to reduce the Blame avoidance effect.

### *Easy*

Paying for road use will need to be as easy as possible, in line with the EAST<sup>1</sup> framework. Any friction involved will create an immediate backlash. While technology will be vital for making things easy for the road user, it will need to be tried and tested to avoid glitches and avoid disadvantaging those who are less 'tech savvy'.

### *Fairness (or inequity aversion)*

To be accepted, the road pricing scheme will need to be fair, and to be seen to be fair. To this end, the price paid will need to reflect the real cost of the journey including externalities such as air quality, noise pollution, impact on climate change, and road congestion. However, it would be unfair if people were priced out of their cars with no suitable alternative provided, so it should also reflect the availability of alternatives.

Measuring the availability of alternatives is challenging since it is impacted by:

- The availability of suitable public transport;
- The availability of attractive active travel infrastructure (also relevant for the 'first and last mile' elements of public transport journeys);
- Some aspects of the journey, such as whether it is part of a 'trip chain', or is particularly time sensitive;
- Characteristics of the trip maker, such as any disabilities or encumbrances.

Transport for London has looked at this and explored which current car journeys are "switchable" and this approach would be a good starting point<sup>2</sup>. As a minimum though, an equivalent to PTAL (Public Transport Accessibility Level<sup>3</sup>) would be required for wherever the scheme was introduced as an indicator of public transport availability.

Given limitations with the available data and the subjective nature of what constitutes a realistic alternative to car, citizen involvement will be crucial

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<sup>1</sup> The EAST framework (Easy, Attractive, Social, Timely) developed by the Behavioural Insights Team

<sup>2</sup> <http://content.tfl.gov.uk/technical-note-17-the-availability-of-realistic-alternatives-to-car.pdf>

<sup>3</sup> <https://data.london.gov.uk/dataset/public-transport-accessibility-levels>

for making a scheme as fair as possible, and for ensuring that it is seen to be fair. Since everyone is impacted by the externalities of car travel such as air quality, noise and climate change, this involvement should be from the whole of society and not just car drivers.

### *Framing (also Anchoring, Choice Architecture)*

Framing is a common technique used in “Nudges”<sup>i</sup>, but for road pricing, how it is presented will be an important consideration for gaining acceptance of the scheme.

### *Habit*

The great majority of car trips are made habitually without any real consideration given to them. However, the introduction of road pricing will force people to think about their choices. It therefore provides an opportunity (a “change moment”) to encourage people to switch to travel options which benefit the individual and society. The relevance of this is that alongside the introduction of a scheme, complementary measures aimed at facilitating behaviour change should be considered. This would also be consistent with being Fair – i.e. that alongside the “stick” of road pricing there are “carrots” in the form of improved facilities and services and incentives for trying out the alternatives.

### *Herd behaviour*

In terms of road pricing, herd behaviour can either work for or against its speedy acceptance, and this reinforces the importance of a trouble-free introduction of the scheme and the technology behind it. It also affects the communications strategy and the importance of keeping on top of social media to ensure a mis-informed anti-road pricing movement doesn't take hold.

### *Loss aversion*

People's aversion to losses is a key challenge when looking to charge for something which is perceived to be free. Drivers are used to being free to use the roads as they like and road pricing will be seen as a loss of this freedom. When communicating with drivers it will be important to be aware of this effect.

### *Messenger*

The evidence is that the messenger is as important as the message, so communications around a road pricing scheme need to take this into account. In this context, the messenger should be seen by drivers as being one of them and not a non-driver looking down on them and telling them what to do. It will of course be crucial for the messenger to be trusted and to be seen as both knowledgeable and empathetic.

### *Present bias (also hyperbolic discounting or short termism)*

Present bias is a notable challenge when trying to get people to act in response to climate change which is seen as quite distant. Air quality can resonate more, particularly for parents of young children or those that have relatives who suffer from asthma, but otherwise drivers are quite remote

from its effects. The same is true of noise pollution, and even with road congestion, drivers often see this as themselves suffering from the effects of other people (see Blame avoidance). The loss in revenue from the introduction of EVs is also not an immediate issue and isn't relevant for a journey which needs to be made now. There is therefore a challenge in getting drivers to see the urgency of a need for them to change their behaviour, and therefore also in accepting the need for road pricing.

### *Primacy of emotions*

The importance of emotions needs to be taken into account when communicating the reasons for introducing road pricing. Hard facts will be part of it, but they will have minimal effect on their own. The communications will also need to address the fear of a loss of freedom, of people being penalised unfairly, and of drivers being demonised for something which isn't their fault.

### *Relativity*

The fact that people think in relative terms presents some challenges, so for example, people living in more rural areas will compare themselves to others who have better access to alternatives to car and will feel hard done by. A scheme which takes into account the local context (such as alternatives available, level of congestion) will help to reduce feelings of unfairness fuelled by such comparisons.

If the overall amount drivers pay in tax is the same as currently, making this comparison will be helpful.

### **Key sources:**

Avineri, E. On the use and potential of behavioural economics from the perspective of transport and climate change, *Journal of Transport Geography*, 2012

Metcalfe R. Dolan P. Behavioural economics and its implications for transport, *Journal of Transport Geography*, 2012

Garcia-Sierra M. et al., Behavioural economics, travel behaviour and environmental-transport policy, *Transportation Research*, 2015

New Economics Foundation, *Behavioural Economics: Seven Principles for Policy Makers*, 2005

Samson, A. (Ed.). *The Behavioral Economics Guide 2019* (with an Introduction by Uri Gneezy). 2019

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<sup>i</sup> This 2020 paper reviews the effectiveness of nudge interventions and includes data on the frequency with which different nudge techniques have been used: <http://www.nber.org/papers/w27594>