

INFORMATION REQUIRED FOR PROJECT PROGRESS REPORTS

(All relevant projects should have submitted reports by 31 Jan 2004)

Programme Name : Environment and Human Behaviour
Project Title : Taxation Futures for Sustainable Mobility
Award No : RES-221-25-0013
Award Holder(s) : Dr. Stephen Potter
Period of Report : 1.01.2003 to 31.12.2003
Institution(s) : The Open University
Total ESRC Award : £38,958

Aims and Methods of Research:

Project Aims:

- To synthesise existing research by a number of people who have explored different ways in which the taxation and charging regime could be structurally altered to be more amenable to the effects of pricing signals;
- To provide a framework in which alternative transport taxation and charging regimes can be explored;
- To identify what conditions, supporting measures and technologies would be needed for the alternative regimes;
- To identify an agenda for future research on the issue of appropriate taxation regimes for use with sustainable transport technologies and behaviour patterns;
- To undertake this research in a way that actively involves policymakers and implementation agencies

Methods

Like other projects in the programme, the intention is to synthesise existing research and not to undertake the substantial gathering of new material. The method adopted was to integrate existing research into a series of tax system scenarios, which are assessed for their tax income and ability to deliver effective environmental signals to car users. This has been undertaken by inputting the scenarios into an adapted version of the Dutch Mobility Explorer modelling program.

The scenarios developed were:

1. **Business as Usual:** retaining annual Vehicle Excise Duty (VED) and fuel duties.
2. **Company Car Distance Charging:** with Company Car Tax replaced by an annual distance-based charge weighted by CO₂.
3. **VED replacement:** Annual charge replacing VED based on distance driven weighted by CO₂ and fuel type for the car model type
4. **Car Distance Charging:** Annual charge replacing VED and fuel duty based on distance driven weighted by a CO₂, NO_x and particulates for the car model type.
5. **GPS-based congestion charging:** Varied by area, road, time of travel, (possibly direction of travel - peak flow and contra-peak).
6. **GPS-based congestion and emission charging:** Varied area/time/road weighted by car model emissions.

Confirmation Statement:

The research is being conducted as anticipated in the initial contract with ESRC.

Highlights of the Research and Important Findings:

At the time of applying to the ESRC to undertake this research, the concept of replacing the existing car taxation regime was a little considered issue on the fringes of transport policy. The applicants felt that it was a subject that would eventually emerge as of key importance and were thankful of the ESRC's support of this view. The rapid emergence throughout 2003 of proposals for national road user charges as a replacement for existing car taxation has highlighted the timeliness of this EHB/ESRC project. In June 2003, Alistair Darling, the Secretary of State for Transport, announced that replacing road fuel duty and vehicle excise duty (VED) with an area-wide road user charging was a key policy tool to deal with 'pressures over the next 20-30 years'. A Department for Transport working party has been set up to explore the form of the new system, timescales and implementation.

The research has highlighted the social, policy and economic drivers that have resulted in the rapid ascendancy of the concept of national road user charging. We have identified a combination of four key factors, and in doing so have built upon the analysis contained in our project proposal. These are:

- The ongoing failure of transport policy to include sufficiently effective behavioural change measures to cut congestion and reduce emissions;
- The rise in the cost of transport policy interventions (including significant costs rises for rail and expenditure in the motorway widening programme);
- The reduction in Treasury income of eco-reforms to the current tax regime and policies to promote cleaner vehicle technologies;
- The difficulties of taxing fuel in a future multi-fuel transport sector and equity issues of taxing fuels at different rates in different sectors.

This project has undertaken a distinctive analysis showing how these factors combine to explain that the replacement of the current car taxation regime has long-term structural causes. This is reinforced by our work identifying that tax regime change to a car road user charge has occurred in societies as contrasting as a rural state in the USA, the Netherlands and the UK.

Having identified the nature of the drivers behind the proposed tax regime change, a second set of key findings relate to the design of the proposed policy measure. The modelling exercise and comparison to other modelling work has sought to highlight three key findings:

1. There has probably been too much focus on designing an ideal car taxation system that cannot be realised for at least 10-15 years. The transitional path to such a future and the role of transitional reforms are crucial. Of particular relevance are interim stages that permit learning and adaptation to occur.
2. The UK has a current policy focus upon congestion reduction, which has led to the proposal for a complex congestion charge using GPS and in-car technologies. This could have serious negative second order impacts (for example leading to traffic growth shifting to low charge areas and times and major land use effects). Other countries are exploring a simpler distance charge system, which, although seemingly less effective, may deliver the bulk of benefits with less negative second order impacts. This project has shown that different road user charging scheme designs have very important differences in terms of their transport, social and economic impacts, which this project is proceeding to document.
3. A clarity is needed of the policy goals that a national road user charge would address. It may be that the UK is depending too much on this tax reform, possibly seeing it as a way to avoid the hard

political decisions that have dogged transport policy to date. A tax regime change does not lessen this political dilemma.

Overall, an important part of the EHB programme has been to help establish and consolidate networks of researchers around key EHB research issues. This has certainly been the case in this project. Our network is now viewed as representing as key players in the field, is producing results that attract interest and questions that challenge. Our network has been very fruitful and we expect to continue to work closely in the future.

Changes to Original Award:

At the time of the award, Dr. Parkhurst had just moved from University College London to the University of the West of England and Dr. Enoch was about to move from the Open University to Loughborough University. These moves were reflected in agreed changes to the award and the subcontracts involved.

No other changes have been involved.

Research Staff:

Dr Stephen Potter, Senior Research Fellow at the Open University, is the Principal Investigator.

Graham Parkhurst, of the University of the West of England, is a Co-investigator

Dr. Ben Lane, Research Fellow at the Open University is funded to work on the project. He was appointed part-time throughout the project's duration.

Dr. James Warren, at the Open University also contributed (unfunded) to the project.

Dr. Marcus Enoch, Lecturer at Loughborough University has a subcontract to contribute to the project throughout its duration.

Barry Ubbels and **Paul Peeters** at the Free University of Amsterdam had a subcontract to contribute to the project throughout its duration.

Publications:

- Lane, Ben (2003): *Road fuel gases and their contribution to clean low-carbon transport*. A submission to the Department for Transport road fuel gases consultation. 17th September.
- Potter, Stephen (2003): *Transport Taxation Regime Change? Town and Country Planning*, September, pp 240-241.
- Potter, Stephen (2003): *Viewpoint: area-wide road user charging*. *Local Transport Today*, 27th November, p 14.
- Potter, Stephen, Lane, Ben, Ubbels, Barry, Peeters, Paul and Parkhurst, Graham (2004): *Adapting the Dutch 'Mobility Explorer' Programme to Investigate possible Car Taxation futures in the UK*. *Universities Transport Studies Group Annual Conference Proceedings Vol 2*, January.
- Potter, Stephen, Parkhurst, Graham and Lane, Ben (2004, forthcoming): *Towards a new fiscal framework for transport*, Chapter in *Methods and Models* section in Reggiani, A and Schintler, L (Eds): *Transport and Telecommunications: New Perspectives from Europe and America*.

Engagement with potential Research Users (outside the academic community):

There has been regular contact with a series of users, including members of the Department for Transport Working Group on National Road User Charging. In addition, two project seminars have been organised and papers delivered at two other key seminars. Members of the research team have also taken part in other relevant seminars (e.g. the Institute for Public Policy Research's seminar on Road User Tolls). The specific user events were:

Mid Project Seminar held on July 3rd 2003 attended by user groups including representatives from the Department for Transport's Transport, Environment and Taxation Division and the Science and Technology Policy Division, Strategic Rail Authority, Transport 2000, Inland Revenue and the Institute for Public Policy Research.

Paper: The Impacts of Taxation and Charging on Social Division delivered to the ***Transport Seminar on Social Exclusion***, 11th December 2003. This was organised by Transport 2000 in conjunction with the Department for Transport as part of a series of seminars to feed into the revision of the Ten Year Transport Plan. Various government departments, NGOs, researchers and other user bodies were represented.

Paper: Social Inclusion and Road User Charging, delivered to the ***National Transport Activists Round-table Seminar on Road User Charging***, 21st January 2004. Attended by a wide range of transport NGOs.

End of Project Seminar to be held on February 6th 2004. User group acceptances from HM Treasury (Head of Environmental and Transport Taxation), Department for Transport (Transport Environment and Taxation Division, Integrated Transport Economics and Appraisal Division, Road Charging Division), Strategic Rail Authority, Transport Research Laboratory, Inland Revenue (Road Pricing Analysis and Research), Energy Savings Trust, Institute for Public Policy Research and Transport 2000.

Contribution to Programme

Members of the research team attended and presented at the two EHB Programme seminars in 2003. The presentation at the first workshop was on the generic cross-programme issue of the role of incentives and sanctions in public policy development, with the presentation at the second workshop reported progress on our project. The team will contribute to the Programme's final seminar in May 2004.

Detailed Progress:

With the rapid emergence throughout 2003 of proposals for national road user charges, the research team did re-evaluate the research objectives. In general we found that they remained robust and relevant. Indeed we felt them to be more thorough than the often rather narrow and technical objectives used by others to research this subject. However one issue that came to be highlighted in the emerging debate was that of social inclusion in the design of taxation measures, and in consequence we have placed more emphasis on this issue in our research.

The first stage of the project involved scenario development and an initial familiarisation with the Dutch *Mobility Explorer* program (including identifying how this could be adapted to model the UK transport system). This involved team meetings in the UK, the production by the VU of a methodology working paper on data requirements for *Mobility Explorer* and a two day visit to the VU in Amsterdam. Initially we had envisaged using the *Mobility Scenario* program, but on the recommendations of our Dutch colleagues the more advanced *Mobility Explorer* program was adopted for the project.

The scenario development and project plans were presented to a user workshop on July 3rd. This input from users led to changes in the scenarios being made to meet their requirements more closely.

A second team meeting was held at the VU in August 2003 to assess the baseline model and the first scenario runs. The scenario methodology has proved to be appropriate. The use of the Mobility Explorer program did raise some difficulties. To adapt the Mobility Explorer for the UK a redefinition was required of many of the data fields and inputs, particularly where the input fields were structured according to uniquely Dutch definitions. We therefore had to rework UK data to fit Dutch definitions as closely as possible. For the base Scenario and Scenarios 3 and 4 this worked well, producing very useful results that we were able to compare to a separate UK modelling exercise that was published in mid 2003 by Professor Stephen Glaister of Imperial College.

For scenarios 5 and 6, which involved a congestion charge rather than a simple distance charge (which the Dutch model was designed to explore) there were more major difficulties. We sought to mimic indirectly a congestion charge using what variables were available within the model (e.g. a city cordon charge). This did not produce a satisfactory result and went beyond what the model was able to accommodate. However this has proved to be of less importance than originally envisaged as the Glaister model deals well with a congestion charging scenario.

In consequent discussions with users and participation in road user seminar, one important issue to emerge is that the UK has focused upon one type of national road user charge (congestion charging). Our research has revealed that several types of road charging systems are possible. For example our research identified the innovative 'opt-in' distance charging scheme in the US state of Oregon, which was unknown to our UK users. Different road user charging scheme designs have very important differences in terms of their transport, social and economic impacts, which this project is proceeding to document. We are therefore developing variations of further scenarios of the successful distance charging modelling to explore such variations and to compare with the Glaister congestion-charging model.

We expect to be able to submit the project's Final Report, as required for March 31st 2004.