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Road User Charging – Creating a Supportive Environment for Mobility Management

Workshop 2C: Driving forces and incentives for implementation

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Introduction

Mobility Management measures offer excellent mechanisms to support the shift towards more sustainable travel choices. EPOMM and other initiatives have provided European cities with a wide range of inspiration and have led to implementation of numerous successful schemes.

Overall, however, the majority of European cities and regions still experience an ongoing rise in car usage resulting in the twin problems of the environmental impacts of congestion and the physical impacts of new highway construction.

Outside the EC, the problems in the NAS and elsewhere are even more extreme, with potential for considerable increases in car usage if radical measures are not in place to encourage modal shift.

This paper reviews the way in which fair and efficient road user charges can create an economic environment in which Mobility Management measures will represent a more attractive option to existing car users. The paper will consider the rationale behind road user charging, with a particular emphasis on its ability to improve local economic efficiency by ensuring that road space is available to essential users. It will also review the International and European State of the Art and the lessons to be learnt from schemes which have been implemented to date in Singapore, Norway, Rome and the UK. It will also address some of the concerns about the societal implications of Road User Charging and the ways in which Mobility Management solutions can help to redress such concerns.

The paper also considers the way in which the availability of Mobility Management measures can contribute to the success of Road User Charging schemes, and consider the more general need for complementary packages of transport planning measures which are able to combine "push" and "pull" mechanisms to achieve collective global objectives.

Identification of the Problem

In very broad terms, both Mobility Management and Road Pricing are intended to reduce car usage. Mobility Management measures, however, depend on attracting or "pulling" drivers from the car, whereas Road Pricing directly encourage or "push" drivers towards modal shift. The distinction can perhaps be illustrated by reference to recent market research undertaken in the UK.

Transport Direct[1] is a Department for Transport (DfT) initiative to exploit the opportunities created by new technologies, notably the internet, to achieve a radical integration and enhancement of the information available to people wishing to plan a journey.

The Transport Direct concept embraces three fundamental aspects of mobility:

- Travel Planning – considering all alternatives for making a journey, including all modes (i.e. walking, cycling, car, bus, coach, train, ferry and air) and combinations of modes.
- Travel Booking – the ability to book, pay and obtain tickets for a journey at the same time as making the enquiry.
- Real-time Information – on how travel options are performing in real time, before and during the enquirer's journey?

Transport & Travel Research Ltd[2] was commissioned to carry out some qualitative research into the role of Transport Direct in providing a source of such information for the public who wish to travel by car. This comprised market research with seven groups who were fairly typical of the public at large in as much as they consisted mainly of individuals who exhibited a high degree of car dependency: where there was a willingness to consider using public transport, this mainly related to the use of trains for longer journeys.

In terms of whether the Transport Direct service might encourage modal shift away from the private car, there was a feeling that increased use of public transport in the future would be more dependent on the quality and reliability of the services themselves, than on the quality of information provided. The results of the group discussions therefore suggested that Transport Direct, when considered in isolation, might have only a limited impact on encouraging the use of public transport for local travel. This was particularly true for participants who described themselves as being fairly time-constrained (especially families with young children).

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[1] http://www.dft.gov.uk/itwp/transdirect

[2] *Transport Direct – Travelling by Car,* Bewick, Fereday and Barham (TTR), INFORM CONFERENCE, Merseyside, 2002

There were, however, some clear indications as to why the private car was preferred as a means of transport, suggesting ways in which Transport Direct might be designed and marketed with these issues in mind, in order to both maximise use of the service, and provide users with information that will enable them to make informed choices as to which modes of transport to use. For example, the speed and convenience of the private car emerged as being major disincentives for people to use public transport. Cost was also given as a factor that discourages some people from using public transport, especially families or single parents with children.

It can be inferred from this outcome that, however well planned even the most comprehensive and widely available mobility management service such as Transport Direct may be, such measures may not fully convince existing drivers towards modal shift. This is not a failing of the mobility management measure, but a reflection of the current imbalance of the costs of motoring and public transport. Complementary measures to narrow the perceived difference between the benefits of the car and alternative modes are essential if mobility management is to achieve its true potential. Specifically, mobility management measures to enhance the quality of the public transport service offer are undermined by issues of cost and speed, the latter itself being a key element in the overall generalised cost of a trip.

A major driver in the continuing increases in car usage is that motoring remains a relatively cost-competitive mode, offering a high perceived level of comfort and security. If this perception is to be challenged, there is a need for Mobility Management to be underpinned by an economic incentive to behavioural change which reflects the high societal costs of motoring. Otherwise many of those drivers who enjoy the convenience of their car are unlikely to take up alternatives that are on offer.

To take a simplistic example, the AA[3] estimates in the UK that a typical driver with a 1600cc petrol car driving 16,000 km annually pays an average of €0.12 per km on fuel against €0.8 per km overall on motoring. Given that public transport for an equivalent trip may be of the order of €0.2 per person per km[4], it is clear that the perceived marginal cost of motoring is substantially less that that for public transport for a single traveller, let alone a small group. Indeed, given that most motoring costs are fixed, and that many people regard a car as a necessity, the marginal cost of motoring for someone who already owns a car is generally very low. For this reason motorists are quite unresponsive to changes in the costs of alternative modes and only likely to respond to a change in the perceived marginal cost of motoring.

Rational Charging for Transport – A Possible Solution

The case for the introduction of a fair and efficient means of ensuring that travellers meet the costs which their travel choices impose on society has been set out in successive EC policy documents:

[3] www.theaa.com/allaboutcars/advice/advice_rcosts_petrol_table.jsp
[4] Public transport costs vary greatly, but this figure quoted is not atypical for a one-way suburban commuting trip in the UK

- 1995: Towards fair and efficient pricing in transport [5]
- 1998: Fair payment for infrastructure use [6]
- 2001: European Transport Policy for 2010: time to decide [7]

The evolution of thinking in these areas is also reflected in the work of the High Level Group on Transport Infrastructure Charging[8].

The general rationale which guides this work is an understanding of the economic impacts of congestion relating to increases in travel time, as well as the environmental impacts of congestion, both of which can be attributed to high and increasing levels of road traffic. These impacts are considered to represent the core of what is termed the marginal social cost of a trip. Reducing these impacts can address a wide range of urban objectives, including environmental impacts upon health and quality of life, as well as providing better access to economic opportunity and minimising the use of valuable land by transportation systems.

Road transport, in general, benefits from an implicit subsidy, through the provision of road space. Vehicle and fuel taxation are intended to recoup this subsidy, but cannot effectively reflect the varying marginal social costs of transport especially in urban areas at peak times. Public transport is often required to be self-financing, operating in some cases in the free market or in a franchised environment. In such instances, pricing may be entirely based upon market forces, or modified by externalities such as public subsidy.

Specifically, the marginal social cost of road transport is generally greatest in congested areas[9], often the peak hour urban core, where the cumulative impact on congestion, and environmental impacts, especially air pollution, are maximised.

In reality, of course, cities are unlikely to introduce road user charging in order to achieve economic objectives, and are likely to be seeking to achieve one or more of the following:

- Raise revenues
- Reduce congestion
- Reduce environmental impacts

[5] European Commission, Towards fair and efficient pricing in transport, Policy options for internalising the external costs of transport in the European Union, Brussels, 1995

[6] European Commission, Fair payment for infrastructure use: A phased approach to a common transport infrastructure charging framework in the EU, Brussels, July 1998.

[7] European Commission White Paper "European Transport Policy for 2010: time to decide" 2001

[8] High Level Group On Transport Infrastructure Charging: Final Report On Options For Charging Users Directly For Transport Infrastructure Operating Costs, EC 1999

[9] Surface Access Transport Costs & Charges, Sansom et al, ITS 2001

Although there is some overlap between these objectives, the desired balance will affect scheme design and the degree to which they complement mobility management although any such scheme will be broadly supportive of modal shift away from the car.

State of the Art

Although the rationale for road user charging has been set out in EC policy as outlined above, and endorsed in a number of Member States, notably the UK and Italy, the implementation of road user charging has been a slower process for a number of reasons. The EUROPRICE Consortium of cities identified the following issues as being of particular importance in its 2nd Priority Policy Issues Report[10]:

- social political acceptance,
- financing,
- specific technological problems,
- legislative and
- operational issues

Of these social political acceptance has been perceived to be the most significant barrier and has been widely discussed elsewhere[11].

Since 2000, the PRoGRESS project, comprising the cities of Bristol, Copenhagen, Edinburgh, Genoa, Gothenburg, Helsinki, Rome and Trondheim, have been working together to develop urban road user charging plans, but only in Trondheim, where a cordon pricing scheme was already in place, and Rome, where an access control scheme incorporates some elements of road user charging, have measures been implemented.

In the immediate future, however, the policy focus in Europe, and also in the UK, is likely to revolve around pricing mechanisms for the inter-urban road freight sector although the technologies being developed will be highly transferable to the urban sector[12].

Nevertheless, the PRoGRESS project, and the accompanying thematic network CUPID are gathering considerable knowledge on the realities of road user charging[13].

Experience of real-life road pricing is, however, limited, but from the case studies which are available, we can conclude that it will achieve a significant modal shift away from the private car. The main example is the Electronic Road Pricing (ERP) scheme in Singapore whereby varying prices are automatically imposed at 28 entry points to a restricted zone as well as 14 other congested sections of road[14]. Prices are regularly updated to ensure

[10] Technical Paper 2 "Priority Policy Issues Report" Europrice Consortium, www.europrice-network.org
[11] CUPID Deliverable 3, www.transport-pricing.net provides links to a range of research
[12] DIRECTS
[13] www.transport-pricing.net
[14] CUPID Rome Workshop: Scheme Implementation - The Singapore Experience, A P Gopinath Menon, 2002. www.transport-pricing.net

efficient operations by increasing of decreasing the toll for each section of road, in each time period, as a direct response to congestion levels.

Ideally, such a scheme could be extended to enable charges to be related directly to the use of any section of road. The technology to enable such an approach has been developed, and trialled in the cities of Gothenburg and Copenhagen as part of the PROGRESS project, but these trials have currently been conducted on a purely experimental basis.

The original area licensing scheme introduced in Singapore in1975 achieved a 50% reduction in AM peak flows with 83% increase in bus patronage whilst the Electronic Road Pricing introduced in1998 enabled a further 15% reduction in traffic. In Norway, the toll cordons in Bergen, Oslo, Trondheim achieved a reduction in traffic of only 5-7%, but the main purpose of these was to raise revenues through modest tolls rather than to achieve modal shift (indeed some revenues were used for highway construction).

The recent experience of new schemes in the UK show a reduction ranging from 90% in Durham where a comparatively small section of the historic urban core is subject to a charge, to 20% in London where the first major congestion charge in the EC has been implemented[15]. It must be noted, however, that these results reflect the early months of implementation, and in London, in particular, the figures will need to be reviewed once the scheme has become longer established.

Impacts on Society

By definition, any scheme that involves the imposition of charges on car, or other, drivers, will be particularly socially sensitive. A revenue-neutral scheme may help to overcome resistance, but will fail to achieve marginal social cost pricing, will not raise revenues, and may not provide an adequate deterrent to car usage. A number of guidelines to successful implementation can, however, be suggested, on the basis of previous research[16].

- Pricing strategies have to be perceived as very effective solutions, if not as the only effective solution for the perceived traffic problems. People are used to regard public roads as being freely available, therefore there will be strong emotional resistance to any attempt to charge for them. To encourage people to accept charging for road use or parking there must be very good and convincing reasons based on an awareness of existing problems. Implementation in London achieved political support because of the high degree of congestion in the city and its impact on the local economy and quality of life
- Revenues must be hypothecated and alternatives have to be provided. People want to get something for their money. Thus, there must be a package solution, combining

[15] CUPID Deliverable 5, www.transport-pricing.net
[16] A more detailed paper on this topic, offering a wide range of references to available research can be found in CUPID Deliverable 3 “Frequently Asked Questions” www.transport-pricing .net

traffic restraints and road charging with a set of transport and environmental improvements

- Fairness issues have to be considered very carefully. The system must be very carefully designed to ensure that no particular group feels that it has been discriminated against. Exemptions may be needed to overcome particular problems which could otherwise undermine acceptability
- Charging only new facilities can be a rather easy way to introduce road pricing. Using road pricing only for new infrastructure has a better chance of acceptance, as there is a net benefit from the new investment.
- Public acceptability can only be expected if people have confidence in the effectiveness of the measure, the use of the revenues, the fairness and anonymity of the system.
- Successful implementation needs an intelligent communication strategy.

Acceptability remains the most obvious, and perhaps most intractable barrier to implementation but, as discussed, it may not be an insurmountable barrier. The use of complementary Mobility Management measures to offset any disbenefits resulting from a road user charging scheme can help to ensure that the impact on society is broadly positive.

Mobility Management and Road User Charging – Complementary Solutions

The motivations of Mobility Management and many Road User Charging schemes are based around the need to reduce the negative impacts of car usage whilst improving accessibility by cleaner modes of transport.

Road User Charging introduces an economic disbenefit to car usage which may help to discourage drivers who are relatively insensitive to the benefits brought about by improved public transport. On the other hand, the systems provided by Mobility Management will help to ensure that the former driver is presented with the information and services needed to achieve modal shift. Other complementary drivers are the development of more sustainable patterns of land-use planning, and the improvement of the quality of service of public transport, and enhanced facilities for non-motorised transport.

Where road user charging schemes are designed to achieve a significant revenue stream, this provides additional support which may be hypothecated to help subsidise either public transport or supporting services, potentially including dedicated mobility management services. In general ring-fencing of pricing revenues in this way is considered to be a critical element in gaining public acceptance for pricing.

On the other hand, Mobility Management measures in cities where road pricing is to be introduced, should be carefully planned to meet the needs and expectations of habitual drivers. Car owners are a more affluent group, in general, and more likely to value on-line, real-time facilities based around the internet and emerging GSM technologies. Market research can help to establish the gaps in existing information provision which

will be needed to facilitate a modal shift or a change in behaviour. Often confirmed car users have a poor appreciation of the level of service offered by public transport and so dissemination of information through mobility management is more critical than service enhancement. Sophisticated and comprehensive Mobility Management services such as those which Transport Direct will offer should help to meet these needs.

The provision of car clubs will help to reduce the fixed element of the cost of motoring but increase the marginal cost of a single trip, thereby reducing the perceived difference between the cost of public transport and motoring. Such schemes, as they become more widely available, may provide particular help in overcoming the economic disparity between the marginal costs of public and private transport, and therefore provide particular reinforcement to road user charging.

Formalised Car Pooling will enable drivers from rural locations to meet at a fixed node and travel into the urban area in a single vehicle.

Measures to improve cycling not only encourage cycling as a mode of transport for travel to work, but also encourage people to cycle within cities, reducing the need for a car for business travel.

Conclusions

The main issues raised in this paper can be summarised as follows:

- Both road user charging and Mobility Management share broadly common objectives in that both tend to encourage a shift from car dependency towards more sustainable transport choices.
- Road user charging creates an environment which complements Mobility Management by providing a "push" mechanism to actively discourage car usage by drivers who appear relatively unresponsive to mobility management measures
- Road user charging can help to maximise the benefits achieved from new Mobility Management initiatives such as Transport Direct
- The economic rationale for road user charging is proven and, despite awareness of a range of barriers to implementation, the limited examples of such schemes demonstrate a strongly positive contribution to modal shift
- Road user charges can be hypothecated to fund Mobility Management measures as well as public transport services, thereby providing further reinforcement of Mobility Management

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