THE COSTS OF IMPLEMENTING ROAD PRICING SYSTEMS

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ABSTRACT

There is world-wide interest in moving to charging for road use, in order to reduce congestion and pollution, and to move to a "fairer" system of charging for road use than fuel duty and fixed charges such as Vehicle Excise Duty. However, there is also concern that the capital and running costs of implementing electronic road pricing are disproportionate. This paper reviews the reasons for moving to electronic road pricing (aka congestion pricing, road user charging, electronic fee collection), and indicates the costs of scheme implementation, based on real case studies and on the aspirations of some national Governments

Classification: 4. Infrastructure and Traffic Management (b) Congestion Management, (c) Travel Demand Management, (d) Integrated Corridor Management (e) Payment Systems, (f) Traffic Control and Enforcement (g) Performance measurement.

INTRODUCTION

Norman Mineta (US Secretary of State for Transportation) and Alastair Darling (former UK Transportation Secretary) expressed concerns about road traffic congestion & pollution, and to the trend towards alternative fuel and hybrid vehicles which will reduce fuel duty revenues. Also a widening funding gap to maintain road infrastructure and increased use of PFI/PPP is driving introduction of charging and managed lanes. But as Oregon DoT points out, "From the standpoint of tax policy, the gas tax is close to perfection. Nearly all the hallmarks of good tax policy can be found in Oregon's efficient gas tax collection system" (Table 1).

Advantages of the gas tax	**Disadvantages of the gas tax**
▪ Raises substantial revenue. Provides 60% of Oregon road revenue (combined state and federal). ▪ Ease of payment by consumer -- included in fuel bill and allows cash or credit payment. ▪ Ease of collection. Embeds collection within commercial transactions paid by distributor, reimbursed by retailer and, in turn, by consumer. ▪ Easy to administer. Low cost of administration. Auditing costs the state only $1 million annually. ▪ Minimal evasion potential. Illegal gas sales rare. ▪ Protects privacy. Paid anonymously by consumer.	▪ Disconnection to highway system. Not directly connected to the burden the vehicle places on a state highway system and therefore unable to support any form of road user charging. Revenue erosion. Vehicle fuel efficiency improvements reduce gas tax payments per vehicle mile traveled – and this will reduce further with the advent of hybrid,

▪ Minimal burden on business -- only the burden of lost revenue from gasoline evaporation.	electric and alternative fuel vehicles

Table 1: Advantages and disadvantages of the gas tax

ELECTRONIC ROAD PRICING TECHNOLOGIES

As Pickford (2) indicates, "Up to 5 years ago, the mainstream technology for electronic toll collection was DSRC …. Schemes based on these formed the backbone of national charging systems in Europe, North and South Americas and South East Asia ... (but) the decline in revenues from gas tax, increased vehicle miles travelled and the unchecked rise in congestion in cities are forcing governments to rethink how we should be charged for road usage. Road User Charging is now firmly on the public agenda. … An emerging policy shift towards distance-based charging with charges differentiated by road type and location is well-matched with the capability of GNSS. The continuing use of point charging schemes …suggests that DSRC-type functionality will remain desirable.".

PUBLICLY AVAILABLE FIGURES FOR COSTS OF ERP SYSTEMS

As Pickford (3) indicates, ".. comparing an area pricing scheme such as the London Congestion Charging scheme with the German LKW truck tolling scheme with simple cost/revenue measures is … inappropriate; Transport for London aggregates all revenues and costs whereas the public reports for the German do not include any figures relating to the operating cost and fees collected from enforcement". Differences in accounting principles, the cost benefits of interoperability and the social costs/utility are often not considered. Table 2 indicates some publicly available figures.

Location	Costs £M		Revenue	cost/ revenue	Comments
	Set-up	Running (pa)			
UK National	£3B	3000	9000	33%	UK DfT Feasibility Study estimates (4) Set-up: 30M vehicles with £100 OBE. National camera infrastructure £20-60M, with running costs £270-530M Back Office, billing, call centre £500M-£1.3B
London		88	210	42%	Real scheme. Design over-engineered to forestall legal challenges hence expensive but new DSC scheme will be cheaper
Stockholm Trial		16	57	28%	DSRC + ANPR. Real system cheaper?
Stockholm: Real system (18 ANPR charge points)					2007: SEK450M (E48.6M/US$62.3M). 2008: SEK350M (E37.8M/US$50.8M) 2009 onwards: SEK200-250M (E21.6-27M /US$29-36.3M) (ITS International 9Aug07)
Singapore		5	27	19%	
M50, Eire	13M€	25M€	80M€	30%	M50 toll plan 12Dec07.doc
Cambridge	30	10	30	25%	Bid for UK "Transport Innovation Fund", so initial/nominal figures

Table 2: Comparison costs of some real and projected charging schemes

Stockholm

The Expert group summary into the Stockholm congestion charging trial (5) indicated that he congestion charge gives a net social surplus of 800 million SEK (around $125 M) per year, and the benefits outweigh the investment cost in 4 years (a short ”payback time” compared to road or rail investments of typically15-25 years). But as Pickford (3) indicates, “There are frequent examples of schemes being compared by their relative operating cost. .. this is fraught with difficulty, prone to large errors, can lead to unfair comparisons and in the worst case could lead to the wrong charging policy being chosen. The usual comparison is the ratio (operating costs / revenues):

(a) Operating cost drivers include the following:
• Volume (economies of scale & scope: diversity of payment channel options.),
• Whether or not the cost of enforcement is included,
• The proportion of services provided internally,
• Investment decisions to achieve high or moderate levels of compliance,
• Accounting treatment (amortisation) of scheme development,
• Cost of enforcement (related to choice of civil or criminal regime).

(b) The drivers of revenue include the following:
• Charging policy (high charges versus low charges); to collect tolls to pay for infrastructure build/operations or to elicit change in road user behaviour,
• Demand and willingness to pay charges for services received (elasticity of demand),
• Whether or not enforcement revenues are included (accounting policy)

COST TRENDS AND CONCLUSIONS

Costs are reducing, due to improved technology and wider deployment. But we must not forget tcosts of compliance and the utility received from charging schemes. We must also distinguish between tolling and charging since there are different policy objectives and cost measures.

The Full Paper will cover cost issues in more detail, with more international comparisons.

REFERENCES

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