Performance-Based Quality Contracts in Bus Service Provision

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June, 2002

NUMBER:	Working Paper ITS-WP-02-11
TITLE:	Performance-Based Quality Contracts in Bus Service Provision

ABSTRACT: Institutional reform of the bus sector is a topical discussion item in a number of countries at present. A specific focus is on ensuring a value for money (VM) regime to identify the benefits to society associated with each dollar of subsidy support from government. This paper argues that a Performance-Based Contracting (PBC) regime offers the best prospects of achieving a system-wide value for money outcome. It proposes a reward system for bus operators that combines payment for delivering a minimum level of service (MSL), that meets government community service obligations, plus an incentive regime that rewards operators for patronage increases (above MSL patronage levels). The patronage incentive is based on expected user and external benefits deriving from service improvements and patronage increases. Cost benchmarking at relevant best practice levels is proposed to ensure remuneration is based on efficient cost levels. The paper argues that a PBC approach is consistent with maximising social surplus from public transport provision across a geographic area, for any given budget constraint and regulatory imposed minimum service levels. The main alternative, Competitive Tendering, is argued to be less attractive than PBC's in terms of securing the maximum social surplus to the community, given the total amount of subsidy support available.

KEY WORDS:	Contracts, value for money, optimal subsidy.
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DATE:	June 2002

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1. Introduction

Passenger transport is characterised by significant market failure, particularly related to the existence of unpriced external costs of private car use. These externalities include issues of social disadvantage, environmental damage and safety concerns. Recent Australian research on the subject of the external costs of road use, for the Bus Industry Confederation (2001), indicates national costs of $30 billion but offsetting revenues from road users of only $11.5 billion. The majority of the external costs are incurred in urban areas which experience substantial levels of traffic congestion and where peak period car use is substantially underpriced. Questions of social disadvantage were not included within this analysis for BIC and would be an additional source of concern.

The existence of these external costs is reflected in governments around the world seeking more sustainable means of meeting passenger transport requirements, including support for public transport because of:

- its capacity to meet social obligations (eg provision of transport options for transport disadvantaged groups); and,

- its capacity to reduce the (unpriced) external costs of private car use for all sources of intra- and inter-sectoral externality[1].

To optimise the performance of public transport in meeting passenger transport requirements and reducing the external costs of private transport, these dual roles need to be reflected in the contractual arrangements that govern public transport service delivery. This can be done by using remuneration systems that separately reward service providers with respect to:

- the community service obligations (CSO) of government in public transport service provision, at efficient cost levels (achieved through best-practice benchmarking); and,

- an incentive component related to the public transport user benefits and additional external benefits from attracting passengers from private cars to public transport flowing from service improvements[2]. The public transport user benefit component is an important ingredient since, under regulated fare environments, operators are constrained in their ability to be rewarded for user benefits that flow from their service initiatives. The external cost component is vital because of the scale of these costs from road use and the urgency to take action to reduce them, as part of the development of more sustainable land transport systems.

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[1] Although congestion (as an intra-sectoral externality) is typically the largest single externality in terms of total cost, it is not the only cost and inter-sectoral matters of health and safety are essential elements of an environmental improvement package. In BIC (2001), congestion costs only accounted for 42% of total external costs of road use in Australia.
[2] A potentially relevant matter of detail is to establish rules for handling switchers from environmentally friendly modes such as walking and cycling. While this might be a valid inclusion in the user benefit component, it might be argued to be a loss of positive externality. We would argue that it is unlikely that many walkers would use a bus for the line haul but they may for short trips to interchanges such as railway stations. Interestingly this growth in bus patronage might be what is needed to justify new services for others to benefit from (a threshold argument). On balance we argue that some approximations must always be made for any regulatory regime to function administratively. These niceties of theory may well have to remain as just that. On balance it is assumed that it is a good thing to generate extra bus passengers. In the 1970's in the UK maximisation of passenger kilometres was shown to be a very good surrogate for maximisation of social welfare (Beesley et al 1983).

In this paper we set out the rationale for performance-based contracts (PBC's) as a way of delivering social and environmental outcomes consistent with government policy, recognising the financial stringencies of public budgets and the need for appropriate incentives for operators to deliver value for the subsidy dollar. Importantly we recognise the need to ensure that public funds are efficiently allocated at a system-wide level. While PBC's as a concept are not new (eg farebox contracts already exist), the delineating feature herein is that payments above CSO levels are based on social and environmental benefits rather than primarily on commercial considerations. In addition, we recognise that any contractual process must be capable of being regulated in an administratively efficient manner without adding unreasonable burdens on the regulator. A formal framework within which to establish the incentive payments, given the total subsidy available and social objectives of government, is developed in Hensher and Houghton (2002). To avoid detracting from the main theme we have added informative comment in a series of footnotes.

2. The Appeal of Performance Based Contracts

The 90s saw a noticeable increase in competitive tendering of a range of services that had previously been supplied by governments, mainly driven by pressures to reduce the budget cost impact of service provision. The focus was thus typically on minimising costs to government (under the label of cost efficiency), rather than on delivering specific service quality outcomes.

The Scandinavian experience in recent years is particularly revealing. Experience with competitive tendering suggests that it can help to reduce costs but it is by no means necessary to achieve this objective. ITE (2000) reports that about 80% of publicly served routes in Sweden and Denmark are open to tender; in contrast the figure is 7% (as of July 2001 – see Carlquist and Froysadal 2001) in Norway. However, "there is no indication that public transport operations in Norway are less cost-effective than those in other Scandinavian countries and the level of subsidy is much lower" (ITE 2000). According to Carlquist (2001), the *possibility* of tendering per se in Norway seems to have delivered sufficient impetus for cost reductions.

Preston's (2001) review of competitive tendering in Europe brings out the tendency for public monopoly in service provision to be replaced by private monopoly, with a small number of the same monopolists recurring in different locations (including Australia). This development in erosion of a large number of players and replacement with a few large players is a cause for concern, since it opens up the greater possibility of the regulator being "captured" by the monopolist, as may perhaps be argued to be happening with the train and tram franchises in Melbourne in 2002 and a gradual upward increase in contract prices[3]. In such circumstances, apparent cost savings from competitive tendering are open to erosion over time with the added risk of losing control of the overall objective of efficiently allocating the total subsidy budget across the entire public transport system.

Performance-based contracts (PBC's) have emerged as a practical alternative to competitive tendering (CT) in some jurisdictions (eg Hordaland Norway), based on the premises that:

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[3] A factor that has driven business consolidation in the British bus sector is the long-term advantage in securing very high market share in a region (Roberts 2001).

- competitive tendering tends to focus on cost reduction, whereas governments are increasingly recognising the need for much broader outcome objectives (eg of the triple bottom line variety involved in reducing the external costs of car use) *and* closer control of total subsidy payments (which is not the same as reducing subsidy support);

- each geographical location is different and in recognition of this, PBC's acknowledge that the experiences to date (especially in recent times) should at the very least be used as the starting basis for determining the first round optimal service and hence subsidy levels under benchmarked best practice costing and appropriate payment incentives;

- a transparent partnership between the regulator and the service provider offers the most effective way of delivering transport services, ensuring that the allocation of subsidy is determined optimally *from a system-wide perspective* not on an individual contract by individual contract basis (as would be required under competitive tendering – see below); and,

- both parties should share the risks and rewards that a quality partnership can deliver (in contrast tendering suggests some principal-agent relationship which is not partnership compatible). This is known as bilateral governance (Alexander 2000).

International evidence supports the view that the good bus operators are much closer to the customer and therefore enjoy market knowledge that is greater than that of the regulator[4]. There do exist 'bad' operators as well and hence the onus of a PBC regime is to provide the environment in which all operators can improve their performance by having to operate at best practice costings within an operating setting above MSL's and, as a consequence of appropriately structured incentive payments, they are then likely to seek out new opportunities to grow the market. Performance-based contracts recognise this expertise and are structured via incentives to harness the expertise so that customers and the wider community can reap the benefits. Operators who are not able to operate under benchmarked costs can exercise the option to sell up. To ensure the incentive scheme is effective there is a case for considering a requirement to grow patronage[5] above MSL patronage by an agreed annual percentage (ie a growth target) or face having the contract subject to competitive tendering. Reviewing MSLs will be an essential element of the PBC process to ensure that the MSLs, as a base above which incentive payments are established, remain appropriate to the needs of a contract area.

The idea of Performance Based Contracts is not new and has received strong and growing support in Europe, especially in Scandinavian countries (Carlquist 2001, Johansen et al 2001), where several Regional Authorities in Norway have rejected competitive tendering except as a last resort strategy (ie non-compliance under PBC's)[6]. The

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[4] Market knowledge is more than simply having data from electronic ticketing (which in time will be increasingly available to regulators). It also involves a much more intimate local knowledge of the population and historical evidence on what service changes have worked or not worked.

[5] It is the operator's responsibility to grow patronage in any way possible but we must establish unambiguous rules that establish what is actual patronage growth. For example, an increase in boardings achieved by redesigning the network to force bus-to-bus transfers to complete a trip might be argued to not be patronage growth but simply the same individual having to double their boarding without increasing their trips.

[6] Some Counties in Norway have adopted tendering systems while others have continued with conventional negotiation schemes. In Sweden, there is some critique of the widely-used tendering/gross cost contract model (London model), although few truly

focus of PBC's is on getting the right incentives in place to ensure that subsidy allocations (and hence service levels) are optimal from a *community perspective*, encompassing CSOs, public transport user benefits and external cost reduction. The idea is simple: individual operators are offered a subsidy per vehicle kilometre for the provision of minimum service levels (MSL) and an incentive payment in the form of a subsidy per passenger trip for passenger numbers above the trip numbers associated with the minimum service level, in return for delivering a level of service and fare regime that satisfies both the social obligations of government and the commercial objectives of operators. Importantly, the subsidy levels established under PBC contracts are derived from social and environmental criteria and not commercial criteria but they recognise that the latter must be taken into account if an operator is to deliver value for money in the way they use subsidy.

If CT specifications are defined in the same way as a PBC with a bid to deliver the CSO MSL and a bid to deliver additional passengers at a subsidy dollar per passenger (distinguishing the user benefit and externality benefit dollar rate), they might be seen as approaching the optimum social outcome that PBC's offer. This necessary condition is that *the entire set of contracts awarded under CT have hit on the right levels of service and fares so as to maximise social surplus* while delivering normal profits (ie not excessive profits under the total system-wide subsidy cap). This would be an accidental outcome of the CT process, rather than being the intended result it would be under a PBC regime as proposed in this paper. If a similar outcome were to be pursued by subsequent negotiation between the regulator and prospective winning tenderers, to better approach a social optimum across a full set of tenders in an area, this begs the question of why competitive tendering was attempted in the first place! One might just as well proceed straight to direct negotiation with existing service providers for a performance-based contract. In Hensher and Houghton (2002), the idea of performance-based contracts is developed and implemented system-wide within the Sydney context for outer area service providers, as an illustration of how the approach would work in practice.

Unlike competitive tendering as we know it, performance-based contracts do not dictate the details of specific service levels (at least above MSL)[7] but rather encourage the operator to build on their knowledge of the market to move service levels to those that deliver the best value for the subsidy dollar. Competitive tendering is not excluded from the contract regime, rather it is used as an effective instrument to protect the market of consumers if an operator defaults on the delivery of service levels that arise from determination of optimal subsidy outlays.

Competitive tendering is market driven at the time of bidding but generally provides the wrong set of incentives to do more in line with social obligations or external benefits. The market will not identify (or guarantee) the optimal level of subsidy as derived from a social surplus maximisation model in which profit maximisation and external benefits

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innovative alternatives have emerged. In Denmark, a similar model is used, notably in the Copenhagen region, but there is opposition against tendering regimes, notably in Aarhus, where the municipal operator and the authority have opposed tendering in favour of a benchmarking-inspired model. The Norwegian Ministry of Transport and Communications are currently incorporating performance-based elements in their contracts with Norwegian State Railways.
[7] The inclusion of a MSL in a PBC may appear to be a contradiction since it is likely to impose a specific rigid timetable and network. In part this may be true (given historical interpretations of MSL), but we would prefer a looser interpretation of MSL being simply a minimum amount of service vehicle kilometres. One might reasonably expect an operator to respond under MSL with a profile of operating hours, frequency, average age of vehicles, fare concessions and accessible vehicles (associated with a minimum revenue VKM) to be approved by a regulator but not to be a very precise requirement.

are both taken into account. This is especially problematic at a system-wide level, where the need to establish an incentive payment scheme taking into account all services in a geographical jurisdiction (eg a metropolitan area) is crucial to the calculation[8]. Competitive tendering is focussed on individual contracts with no mechanism to ensure that the incentive payment support sums to the optimal subsidy commitment across a broader geographic area. This is the area where PBC is much better because it takes advantage of the market, the obligation on delivering value for money spent from taxpayers in the form of optimal subsidy and external benefits. If bidders under CT are offering prices that comply with profit maximisation, then this is taken into account under PBC's but within a framework in which profit maximisation must comply with conditions of social surplus maximisation[9].

To these points can be added the concern that competitive tendering is open to the regulator being captured by powerful monopolist providers, a particular concern as the number of operators diminishes with global purchasing. Provided remuneration of operators under PBC's is based on efficient cost benchmarks, government objectives might be better delivered in this contracting environment (under a transparent partnership) than under competitive tendering.

There might be some concern that rejecting competitive tendering in favour of PBC's will entrench existing franchised service areas[10], when perhaps some re-arrangement of these areas would better achieve social goals from service provision. PBC's depend on partnership relationships, both between individual operators and the regulator and **between the set of operators and the regulator**. One condition for the regulator agreeing to a system of PBC's across a region or area, where these PBC's are not delivered by competitive tendering, should be acceptance by the industry of operators in the region/area that, if strategic planning processes suggest a restructuring of service franchise areas, the industry will negotiate the change amongst participating operators. Provided the industry is closely involved in the strategic planning processes, this

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[8] There is growing concern in England that concessionary fare subsidies are not matched by appropriate 'deliverable and measurable outputs' (DLTR 2002). The Director-General of the Greater Manchester Passenger Transport Executive stated in a submission to the House of Commons Transport Select Committee's inquiry on the bus industry that "We would like to reach a point where all the money paid to the bus industry is linked in some way to outputs'. The most interesting feature of the reform proposal is, over a 3-5 year period, to transfer some or all of the concessionary fares budget into a central pot. Operators would then be asked to come forward with proposals for delivering a network of commercial and supported services determined by the central authority and 10 metropolitan governments. This has been described as 'voluntary quality contracts' that push at the limits of quality partnerships but which is necessary to improve the increasingly poor quality of service levels of bus provision (which has evolved out of economic deregulation and competitive tendering of non-commercial services).

[9] Although competitive tendering of PBC's is always possible, if it were introduced it must be based on a selection system that involves service quality criteria rather than the conventional minimum-cost criteria in most non-PBC tendering processes (ie the 'lowest price wins'). Telemark County in southern Norway has recently adopted this model, although it is too early to see how it compares with PBC's per se. The ability to optimise system-wide social surplus still remains a challenge however. In discussions with Carlquist, he supports the position taken here that a tendering system (be it a lowest-price based bidding or a quality-focused approach) will have difficulty in controlling the systemwide allocation of funds. His team at the Institute of Transport Economics in Oslo will be investigating this issue if Telemark County accepts their proposal for a research project. Carlquist comments that "Currently it seems that elements of PBC may be incorporated in the quality tendering system ("QTS"?) in the sense that the best quality bid within a given financial limit will be accepted, but that there is a considerable degree of freedom within that limit, defined by various incentives. I must admit that we currently do not know exactly how to sort this out…" The contention of the current authors is that competitive tendering on single contracts cannot deal with this problem of social optimisation at an area-wide level, where multiple contracts are involved across the area.

[10] A commentator suggested that: "Reform of contract areas is a key issue in any reform of bus service regulation. ….It is generally recognised that in Sydney, areas are too small, and service provision would benefit from amalgamation. There would also be benefits to the regulator in implementing PBC's if areas were bigger, and fewer operators to deal with." This is an issue of great sensitivity in the debate on bus reform in NSW. It implies that opportunities for operators to cooperate (even form strategic alliances such as the very effective one in Perth across 3 operators contract areas to offer an orbital service) cannot be achieved and hence we have to have large contract areas operated by a single operator. The Mohring effect which promotes benefits on the demand side from increased network integrity says nothing about this only being achievable by larger contract areas. Given constant returns to scale on the supply side the real risk is that amalgamation leads to cost increases and pressures on government to provide increasing levels of subsidy to pay for quasi-monopoly rents and featherbedding. What we need is incentives to do this through contract area alliances. PBC's are the instrument.

condition of PBC's is a reasonable price for certainty.   This is the approach being explored by the bus industry in Victoria, Australia (in a setting where most bus services were initiated by the private sector decades ago)

3. The Hordaland (Norway) and New Zealand Models: A Healthy Starting Position

Norway and New Zealand provide leading edge examples of how performance based approaches to public transport delivery can be structured at the urban, regional and rural levels. The aim in both cases is to give greater effect to the economic rationale for service subsidy, namely bringing operations more into line with social surplus considerations. Benefits to existing and new users from service improvements are rewarded and there is also a prospective reward for reducing external costs.

3.1 Hordaland

Hordaland[11] is one of three areas in Norway where performance contracts (called "quality contracts") are being implemented for public transport service provision. The contracts start from the premise that the operator usually has the best knowledge of the market and should be left to design the most appropriate route system. However, for this system to be designed and operated effectively from a social perspective, proper incentives need to be present. The contracts recognise that a profit maximising operator, in making decisions about service changes, will normally only consider the direct marginal implications for costs and fare revenue. This misses two important elements from a social surplus perspective:

- the benefits to existing public transport users from an improved service level (these are essentially an externality to the operator); and,

- the benefits from reducing car use, when that use is "underpriced" in terms of its marginal social costs.

The Hordaland framework seeks to internalise these benefits within an operator remuneration framework that is related to the level of service and to passenger numbers (see Johansen et al 2001 for a formal economic treatment).

The key principles in the performance-based contract introduced in year 2000 are firstly, that the operator is given financial incentives for product development. Secondly, the authorities define a framework comprising overall quality requirements regarding price, service and accessibility. The County may cancel the contract if the operator fails to fulfil the predetermined criteria. Joint co-operation is required for the contract to be fulfilled and the authorities are obliged to enforce measures to improve the effectiveness of the public transport system (eg with respect to matters such as bus priority treatment).

Public transport, considered as a public good, requires incentives additional to those from the market-place to avoid a level of production lower than what is (welfare-)

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[11] Hordaland is a County in Western Norway and includes the city of Bergen. The total population is 450,000. There are three major operators delivering in 1999 about 24 million revenue kilometres per annum and carrying 35 million passengers per annum. Total annual deficit is 170 million Norwegian Kroner.

economically effective. Such incentives apply in the Norwegian approach for minimum kilometres, eg with regard to school buses and other socially necessary services, although this may be granted as a fixed subsidy. More importantly, it applies for increasing frequency and vehicle kilometres, which implies gains for existing passengers as well as attracting new passengers (modal shift). This is especially valid for peak hour passengers, when the marginal costs of extra departures are high.

Larsen (2001) and Johansen et al (2001) present the modelling on which the Hordaland contract remuneration system is based. Fare levels, bus revenue-kms and bus capacities are chosen so as to maximise a social welfare function. Fare subsidies and revenue-km subsidies are then calculated so as to induce a revenue maximising bus operator to select the socially optimal levels of revenue-kms and bus capacities. Fares are regulated by the County but the total payment per passenger received by the operator is the sum of the fare and a subsidy component.

In Hordaland, the *entire* subsidy amount is performance-based. There are specified rates for subsidies per route kilometre, per vehicle hour for peak hours and off-peak[12]. An additional amount per passenger in peak hours was suggested but not implemented. These rates vary among operators, depending on the proportion of urban versus rural kilometres. In principle there is no upper boundary for any of the given subsidy components, but due to budgetary constraints in the County there is a ceiling for the total amount granted.

The authorities define a framework for the minimum quality of service, with regard to fares and accessibility. This also involves a customer satisfaction survey[13]. If customer satisfaction falls below 90 % of the target level, the authority, Hordaland County Council, can cancel the contract and select another operator.

The operators are granted a substantial degree of responsibility for planning and product development. They decide on timetables and frequencies, vehicle types and fares, ie elements belonging to the tactical level, not only the operational. The authorities define certain minimum criteria, and otherwise do not intervene at the tactical level. The operators are free to establish and withdraw routes except for school buses. However, they cannot reduce the number of overall network kilometres without the prior consent of the County.

3.2 New Zealand

Transfund New Zealand has recently developed a Patronage Funding policy for public transport that provides direct incentives for patronage growth. Central Government public transport funding to the NZ regions (not to operators direct) is based on:

- matching base funding levels that existed in 1999-2000;

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[12] Specifically, in the Hordaland model, vehicle kilometres, vehicle hours and passenger trips (differentiated between peak hours and normal hours) are all part of the subsidy calculation and are not related to the MSL as such. The total level of subsidy must at least allow for the fulfilment of the MSL obligations. The vkm-based subsidy primarily reflects user benefits of increased frequency rather than MSL. In the Norwegian model, the MSL is given as a contractual obligation, and technically speaking the subsidy per vehicle kilometre is not offered for the MSL as such. Rather, as in the Oslo model, additional vehicle kilometres and additional passenger trips exceeding a base level are compensated for.

[13] Details of the nature of the survey, its content and regularity is not mentioned in the reports. Hensher and his colleagues have developed a monitoring system centred around a service quality index (SQI) that can separate out service quality issues that are directly under the control of the operator and those which the operator has little if any control over. See Hensher et al (2002) for further details.

- "kick-start" funding of a share of the costs of approved new services and initiatives; and,

- a patronage incentive.

The patronage incentive is based on the same two components included in the Hordaland model, user benefits and externality benefits of improving services and gaining new passengers. Wallis and Gale (2001) report that the externality component includes estimates of benefits from reduced road congestion, plus an allowance for safety and environmental benefits. As a consequence, the payments vary by city, time period and distance travelled. Thus, for example, payments are higher for peak period patronage increases in more congested cities than for off-peak patronage increases in cities with little traffic congestion[14]. The approach is unambiguously intended to direct funding towards locations where public transport improvements can make a difference in reducing road congestion.

To seek some cross-sectoral parity with funding of road improvements, a shadow-price (or "hurdle rate") of funds is introduced into the funding formula, such that only public transport projects that achieve a marginal benefit-cost ratio (BCR) similar to, or better than, that of marginal road projects which receive funding will be supported. The shadow-price is introduced as the value of the marginal BCR for funded road projects, this being used as a divisor of the public transport benefit measure (user benefits plus external benefits from public transport improvements)[15].

The values of the externality benefits in the New Zealand work are presented by Wallis and Gale (2001) as follows:

- environmental and safety benefits are typically in the range of 8-13 cents per marginal passenger kilometre, across all centres and peak/off-peak;

- congestion benefits vary by city, reflecting congestion levels, and are only significant at peak periods. Values were in the 40-50c/diverted passenger kilometre for the peak in the largest two cities of Auckland and Wellington.

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[14] While it is a good idea that payments are higher for peak period patronage increases, many of the public transport improvements that would make a difference in reducing road congestion in those congested inner city areas are out of operators' hands and could be capital intensive (not just operating costs) eg bus priority, banning vehicles in the CBD, introducing cordon pricing, These external strategies that can assist patronage growth are part of what we call the quality partnership initiative that is assumed to occur once appropriate incentives are in place to grow patronage. It is a reasonable presumption that government would support such initiatives if they grow patronage and add value for money to overall government commitment.

[15] Ian Wallis has provided further clarification: the roading hurdle rate is incorporated into the public transport (PT) payment formulation. The roading hurdle rate is first adjusted for the lower risk of patronage funding (ie. based on outcomes rather than forecasts). PT user benefits have been divided by 4 before being added to the externality benefits, with the total being divided by the hurdle rate. Wallis describes the factor of 4 as a purely a political decision, although our understanding is that the value 4 is the marginal benefit-cost ratio from road projects. If it were not included, in general the PT user benefit term would dominate the total PT benefit measure. The Norwegian experience is an interesting contrast: Carlquist advises that large patronage growth has not been an issue in Norwegian contexts so far as almost all PT markets have a fairly limited growth potential. However, there has been large patronage increases for some of the interregional express buses, but these networks do not receive subsidies as they are considered "commercially viable". These networks do indeed produce profits for the operator, but as there may be further potential user benefits due to frequency increases, or other externalities, there could still be a rationale for subsidising these routes, and thus the patronage growth problem could become reality. In practice, however, Carlquist is quite sure that the subsidies will be allocated mostly to those local (urban + rural) networks plus the railway networks where there is a minimum service requirement and limited demand - for political reasons. Thus there has been no need for hurdle rates like in New Zealand so far. But as illustrated in Carlquist's Hordaland paper there do exist maximum levels ("ceilings") of total subsidy payments. He comments in a personal communication (May 15, 2002) that: "Ironically, in my opinion, these maximum levels are often too low to really justify a PBC regime!"

Benefits to existing public transport travellers from service improvements were expressed as a function of the generalised cost (per passenger) of travel by public transport, which was assessed as

G = $2.65+$0.48*trip length.

Dividing this expression by the elasticity of demand with respect to this generalised cost produced the relevant benefit estimate. Elasticity values were put at –1.0 for peak periods and –1.5 for off-peak.

3.3 Assessment

The Hordaland and New Zealand approaches provide a valuable start towards the development of a PBC remuneration system that reflects the service delivery goals of the governments that are providing service funding support. In particular, they direct attention to a support framework in which the social goals of generating benefits to existing public transport users and reducing the external costs of road use are embodied.

The New Zealand approach also includes external benefits from service improvements but it does not deal with the question of defining a minimum public transport service level that might be required in recognition of the CSO function of public transport[16].

The framework developed in Hensher and Houghton (2002) for Australia integrates all the ideas from Hordaland and New Zealand (with some variations) to optimise service delivery and subsidy provision across the CSO component, the additional benefit items (user benefits plus external benefits) and operator returns.

4. A Proposed Performance-Based Quality Contract Regime for Australia

The proposed PBC regime has evolved in recognition of government concerns in many jurisdictions to ensure that public transport is delivered in such a way that it fulfils a broad set of social values and social obligations. In particular many governments promote the use of public transport, promote less use of the automobile, and promote financial support (through direct subsidy) to public transport operators that delivers value for money to the community as a whole.

Such governments recognise that public transport should be promoted to all where it makes sense (see Hensher 2002), and that it has a particular role to service those less able to use other forms of transport (the equity argument).. The equity argument translates into support for minimum service levels (MSL). Compliant with appropriate levels of community service obligation (CSO) associated with MSL, there is a belief that providers of public transport can grow their patronage (see Hensher 2002) by providing levels of service and fare profiles beyond that which might reasonably be subject to CSO determination[17] (the latter defined in terms of a minimum amount of annual vehicle kilometres (VKM) and a maximum fare regime, the VKM regime

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[16] Ian Wallis says that in practice it could be claimed that it does, by taking the existing situation (service levels, fares and funding) as the MSL/CSO baseline. However, this begs the question of whether the starting point bears any relationship at all to a cost-benchmarked MSL or is simply the result of years of history.
[17]

determined through some formula based on population to be served, population density, and other agreed criteria). Such patronage growth will be associated with use benefits to public transport patrons and additional environmental benefits from lowering the external costs of private car use.

Government can contribute through *a regulatory partnership* with public transport providers by supporting an appropriate incentive-based contract regime that rewards improved performance, while setting acceptable lower limits on service delivery that, if not provided, may subject the incumbent's contract area to competitive tendering (CT). Competitive tendering, as traditionally structured, as the immediate 'solution' to market and regulatory performance has not been successful in delivering better value for money while also growing the market of public transport users and reducing automobile use. PBC's of the form described below offer an alternative regime[18]. Indeed CT has fewer degrees of freedom in encouraging an operator to grow the public transport market and deliver increasingly better value for money in respect of subsidy outlays compared to PBC's.

The contract regime proposed herein builds on the models in place in New Zealand and Norway (set out in Section 3) but is an improvement on both in that it avoids arbitrary starting levels of service and fares and uses best practice costs (in contrast to New Zealand) and takes into account the importance of partitioning the incentive payment scheme to recognise a minimum level of service (dictated by a CSO regime), a user benefit (delivered through benefits in costs and service levels to all trips above MSL levels) and an externality benefit through switchers from car (primarily) delivering improved levels of traffic congestion, noise, air quality, greenhouse gas emissions, safety etc). In contrast to the Norwegian model which has an unconstrained subsidy budget, we suggest that the subsidy must be capped for political reasons.

The proposed PBC recognises, in the specification of a contract, two crucial elements:

1. A CSO (linked to MSL as defined by VKM, as determined by criteria such as population, population density and incidence of school children in the population). An MSL grading is provided. The financial impost to government will be a $per VKM applied to total VKM required for each of the peak and off-peak by a specific grading, based on costs that are benchmarked as efficient.

2. A patronage incentive (PI) to deliver passengers above those who will use the service at the service and fare levels consistent with CSO MSL. The incentive takes the form of $ per passenger and incorporates two elements: benefits to existing and new public transport users from service improvements and reductions in external costs of car use for modal switchers ($/passenger converted from car use). Any financial support tailored specifically to school children is scrapped since school children are also subject to the same incentive payment system as other passengers.

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[18] While it can be claimed that competitive tendering can accommodate the same set of contract-specific incentive payment rules, including MSL/CSO conditions, there is no mechanism able to ensure that the total subsidy available (inclusive or exclusive of the CSO payments associated with MSL) are optimally distributed. The PBC framework which avoids the need for tendering of a lot of contracts (over 300 in NSW) has this capability (as shown in Hensher and Houghton 2002). It is unlikely that all contracts can be renewed through competitive tendering at the same time so that the regulator can assess the budgetary implications and the optimal distribution of financial support. Reducing the number of contract as to a handful (as has often been stated) is not a solution since it carries many other concerns about market performance and price escalation.

The determination of the level of the financial incentive is based on the following conditions:

a. A system-wide (eg metropolitan area) total budget or subsidy (TB) is determined by government as part of its broader budgetary determination process. The amount of TB might be determined on an annual basis, with review as to its increase or decrease over time. This is $per annum of TB.

b. The total patronage incentive is defined by TB-$CSO and is calculated at costs benchmarked as efficient. Once this is determined there is no more available to be allocated to the incentive payment scheme.

c. The $CSO payment is defined by $/VKM*VKM for all operators (using the grading classification to define an operator-specific VKM or MSL).

d. In determining the optimal incentive payment (or optimal subsidy) per additional passenger, Hensher and Houghton (2002), in active consultation with industry, has developed a simple calculation template which solves for the optimal incentive payment by taking into account the cost of providing existing and additional service levels, the change in demand associated with improvements in service levels, the TB available, the sum of subsidy support system-wide available after CSO obligations are financed, the benefits to users from increased use of public transport and the externality benefit to society of reducing car use. In addition and in recognition of a desire to ensure that public transport providers act efficiently and at best practice, the cost inputs are based on benchmarked best practice and there is a constraint that the total (best practice) cost must be covered by all sources of revenue (ie CSO + Fare + PI payments) with an acceptable return on investment built into costs (ie normal profits). It is assumed that best practice costings (eg total cost per kilometre) apply to both CSO and above-CSO service and fare level determination.

e. Given the best practice cost regime (peak and off-peak), demand profiles (peak and off-peak), TB and CSO determination, and the normal profit constraint, we are able to establish a PI per passenger for both gains in patronage, that is, growth attributable to any source, plus an additional payment per passenger if they are attracted out of car and deliver reduced VKM for car travel[19].

f. The externality benefit will be derived from known benefits to society through reductions in congestion etc as defined by $/VKM of car use[20]. These unit benefits are available from the literature (as derived from willingness to pay studies).

g. To determine the amount of switching from car we propose a simple application of a cross-elasticity[21] for the respective change in service level (ie PT VKM)

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[19] In the Hordaland model two different effects of new passengers exist: One (negative) is more crowding, increasing passengers' travel time value (less chance of getting a seat, less space) and overall travel time (increased loading times, which also increases operators' costs through reduced speed and dimensioning of vehicles). The other (positive) is the improved service level in response to higher demand, which provides all passengers with higher service frequency or more routes.

[20] The Norwegian model includes only the external costs of traffic congestion in the externalities. They regard the costs of accidents, pollution etc as internalised in fuel taxes. Furthermore, external congestion costs/benefits of modal shift only applies to larger conurbations and in peak hours. Due to relatively low subsidy levels in Hordaland the new regime has not brought about any dramatic changes. Nils Fearnley (ITE Norway) suggests that it is probably too early to evaluate the new scheme because its success rests upon longer term decisions in the operator, like fleet size and composition.

and/or fares. We will also recommend an appropriate reduction in car VKM for specific PT operating environments. A switcher from car to PT is assumed to be an ex-car user for the period of 12 months. After that they are deemed to be a non-switcher.

The proposed scheme requires a limited number of data items from the operator, all of which are readily available[22]. Costs as determined by best practice and patronage data, fares and service levels can be obtained from existing sources (eg The Institute of Transport Studies benchmarking program). Additional inputs such as fare and VKM elasticities for peak and off-peak activity are readily available as are the unit benefit rates for reductions in externalities per VKM for car use.

Hensher and Houghton (2002) have developed a case study to demonstrate the appeal of PBC's over CT as a simple and meaningful way of growing the patronage market from any sources but especially from existing car users, which will operate within the limits of budgetary support from government, ensure CSO compliance and optimal subsidy allocation above the CSO support. The incentive structure is transparent and consistent with global views on the delivery of sustainable transport for sustainable futures.

5. Conclusion

Performance Based Contracts align contract specification closely with the intended policy outcomes from public transport service provision. This will increase the prospects of successful achievement of the intended policy outcomes. The approach will be of great value to government since it will generate data on the social benefits of alternative service level changes, data that will assist government in its determination of the most appropriate level of total funding (TB). It also will encourage development of co-operative partnership relationships between government and operators in service delivery, whereby both parties share the risks and rewards involved in spending the taxpayers contribution to achieve maximal benefit, while the community's transport services are made more sustainable long term. The partnership and the trust relationship are crucial to the success of PBC's. The non-operator has as much responsibility to support patronage growth as the operator[23].

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[21] In the first instance in order to establish an optimal incentive payment regime given the $CSO commitment and the overall subsidy budget cap, we have to make as informed a judgement as is possible on the percentage of switchers from car. Once the PBC system is in place, the source of modal diversion should be identified by some sample survey, which might be undertaken and funded on behalf of the regulator by an independent organisation. Such a survey would be relatively inexpensive since it would involve a few questions from an on-board survey. Our recent experience with a much larger on-board survey to measure service quality showed that the involvement of the bus company in distributing and collecting forms under a sampling scheme designed by the Institute of Transport Studies worked very well and was very cost effective (Hensher et al 2002).

[22] Although readily available we recognise that some items such as elasticities may be controversial, yet in practice a set of starting values will have to be agreed to.

[23] For example, at a presentation of the theme of this paper at the Warringah Council Civic Centre (Northern Beaches area in Sydney) on May 22, 2002, in closing the session the Mayor of Warringah (Darren Jones) suggested that the Sports facility at Brookvale could have a parking station under the oval which would serve as a park-n-ride interchange for a high frequency bus service (almost a subscription service) to and from the two main locations outside of the Warringah peninsula (namely North Sydney and the City). We promoted the idea jointly of a quality contract partnership between the Council (owners of the oval), car park developers and the government bus provider to deliver this door-to-door transport capability such that the risks and rewards are shared. Parkers using the bus service might be given heavily discounted secure parking that is cross-subsidised by parkers who do not use the bus service. A portion of the revenue from parking might also be hypothecated to public transport improvements.

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