Metropolitan Route Bus Services: Public or Private Provision?

Paper prepared for BusVic by Professor John Stanley

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Contents

1. Public versus private provision?[1]

Harvard University Economics Professor, Andrei Shleifer, has posed the question "*What kinds of goods and services should be provided by government employees as opposed to private firms*" (Shleifer 1998, p. 133). His answer is not many.

When the opportunities for governmental contracting are exploited, the benefits of outright state ownership become elusive, even when social goals are taken into account. Moreover, it becomes clear that private ownership is the crucial source of incentives to innovate and become efficient. (Shleifer 1998, p. 135)

Shleifer points out that, when a government knows what it wants to produce, it can express its wishes in a contract (or regulation) and enforce the contract. If it is concerned about monopoly power and the need for price restraint, it can regulate.

In circumstances where a government is not able to fully anticipate and describe exactly what it wants, the theory of incomplete contracts is relevant (Grossman and Hart 1986). Hart, Shleifer and Vishny (1997) apply this theory to the choice between public and private provision, where they broadly refer to those aspects of a product or service with respect to which a contract is incomplete as 'non-contractible quality'. They argue that the choice between public and private provision depends on how different ownership patterns affect the incentives to deliver this non-contractible quality and on the cost of such delivery. This leads to consideration of investment incentives to reduce costs and to improve quality/innovate. Shleifer (1998) argues that, when assets are publicly owned, the public manager has only a relatively weak incentive to undertake either of these investments, because the manager gets only a fraction of the return. A private manager has much stronger incentives because they get more of the returns.

The weak incentives of government employees with respect to both cost reduction and quality innovation underlie the basic case for the superiority of private ownership. (Shleifer 1998, p. 138).

Hensher and Stanley (2008) have applied the idea of incomplete contracts to urban route bus services, arguing for operator ownership of assets to maximise incentives for asset productivity. They point out how negotiated contracts, within the context of a trusting partnership between government service purchaser and the private operator provider, can make an effective contribution to dealing with problems of opportunism that might arise with incomplete contracts, with suitable protections being provided for transparency and accountability (including the threat of tendering) to guard against regulatory capture. Hensher and Stanley set out a range of desirable features of a route bus service contract which will maximise the prospects for intended governmental service delivery outcomes being achieved and for operator expectations to be met, consistent with public policy purposes.

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[1] Helpful comments from Professor David Hensher are acknowledged.

2.   Public transport context

Public transport service provision in many developed countries has changed substantially over the years. With bus services, for example, from an initial situation that was frequently characterised by private sector provision, public sector monopolies typically became the norm. From the mid-1980s, however, while public transport policy and system planning has usually remained as a governmental role (sometimes delegated to a special purpose authority), there has been a substantial swing back to private sector service provision. The enthusiasm that initially accompanied this swing now appears to be eroding somewhat in some jurisdictions and public provision remains the norm in most developed countries. Melbourne's very substantial reliance on the private sector for bus service provision since service beginnings is uncommon among developed economies.

The major reason for the mid 80s (and later) push for private sector provision of public transport services has generally been to reduce the growing cost of services to the public purse and to improve service quality, often in that order – cost reduction first (perhaps more accurately described as cutting the costs of providing something approximating the current bundle of services), followed by quality improvement. The argument is that long standing public monopolies can get "bloated", being removed from the market pressures that drive costs down to efficient levels and promote innovation. Shleifer's (1998) arguments suggest that incentives favour transferring operation to the private sector, to lower costs and increase the prospects for innovation to improve quality.

This thinking was evident in Melbourne rail franchising, where the State Government's five main listed objectives in franchising the city's rail services were to (DOI 2004):

1. secure a progressive improvement in the quality of services available to public transport users;
2. secure a substantial and sustained increase in the number of passengers using the public transport system;
3. minimise the long term costs of public transport to the taxpayer;
4. transfer risk to the private sector; and
5. ensure that the highest standards of safety were maintained at all times.

While five objectives were listed, it was widely recognised at the time that cost savings and risk transfer were the two key drivers for the franchising. This was typical of early rail and bus franchising. Whether operators would actually be able to deliver on their promises was not a specific criterion! The failure of the initial Melbourne rail franchising (Stanley and Hensher 2005), where the major provider handed back the keys within a few years, gives pause for reflection on the merits of private provision.

Melbourne's rail franchising also included contracting out of those metropolitan route bus services (and V/Line bus services) that had previously been run by the public operator, with cost savings and service enhancements being expected from adding these services to the larger

number of existing privately run services. Since that franchising, all of Melbourne's route bus services have been privately provided.

At the end of the day, the argument about the relative merits of public versus private provision of particular goods or services is largely an empirical question. Shleifer (1998) makes the general argument in terms of expected outcomes on cost levels and quality/innovation and illustrates his argument with a number of examples.

The current paper considers the relative efficiency and effectiveness outcomes of route bus service provision by the public and private sectors, to see whether it is possible to draw general inferences about which ownership model can be expected to deliver the best results. It does this by analysing international and local empirical evidence, recognising that the dominant answer from theory says 'private'.

Two different contexts can be distinguished in terms of making such an assessment:

1. efficiency and effectiveness comparisons between public and private sector provision where there have been private and public operators for a long period of time. This is cross-sectional analysis; and
2. comparisons where there is a shift in provision over time from public to private operation.

The second situation uses 'before and after' analysis to assess how efficiency and effectiveness changes with ownership change from the public to the private sector (examples where the move has been the other way, from private to public provision, are rare!). This approach has to confront substantial risks of 'selection bias' (explained below) but it remains the most widely used method of analysing the relative efficiency and effectiveness performance of public versus private operators.

The paper summarises a number of studies that have analysed the relative performance of public and private bus service providers. These studies mainly focus on service cost/efficiency, for two main reasons. First, this is easiest to measure. Second, service quality has only tended to equal, or exceed, cost in importance as a driver of service performance requirements over the last decade or so, such that performance benchmarking data on service quality across publicly and privately operated systems is not widely available. However, some service effectiveness comparisons are included.

In Section 3, the paper reports the findings of a number of Australian and international assessments of the relative cost efficiency performance of public and private route bus operations, encompassing both cross-sectional information and franchised (to private sector provided) examples. Section 4 presents some (very limited) material on service quality. Section 5 provides a number of comparisons of Melbourne's route bus service performance compared with those of Vancouver, the city with which Melbourne regularly "competes" for the title of The Economists' worlds' most liveable city. Section 6 presents a cost comparison of Melbourne and Sydney. Section 7 sets out some conclusions on whether private sector provision of route

bus services is likely to perform better than public provision and suggests a new Australian initiative in service benchmarking

3. Australian and International Evidence on Public/Private Productivity/Cost Differences in Bus Service Provision

3.1 Public/Private Cross-Section Comparison

This section of the paper presents some evidence about efficiency and effectiveness comparisons between public and private sector bus operations from cross-section analysis. In other words, the comparison is of *different services* being run by public and private operators, at a point in time (or over a few years). Section 3.2 considers comparisons based on 'before and after' data, that involve essentially the *same service* being run by *different operators* (a public or private operator) at a slightly different point in time (involving privatisation in some form).

Ian Wallis from (then) Travers Morgan Pty Ltd undertook an early comparison of the costs of public and private bus service provision in Australia (Bus and Coach Association NSW, 1985). That work (reported in Hensher 1987) concluded that the relative cost ratios of public to private bus service costs for Sydney route bus services (at the time) were:

- average cost/km = 1.98
- broad cost comparisons for present services operated by private operators = 1.89.

Hensher (1987) expressed caution about the magnitude of these cost differences, arguing that the cost comparison needed to take account of operating circumstances of different services before any implications could be drawn about cost savings (or efficiencies) that might flow from privatising public services. He undertook such an analysis, using data from seven public operators and eight Sydney private bus operators, using total factor productivity (TFP) analysis. That allows cost influences such as scale of operations, operating environment, etc to be isolated, such that the impact of ownership *per se* can be suggested.

Hensher concluded that the size of the operating unit and its service location had a lot to do with the apparent productivity (cost) differences and that (Hensher 1987, p. 223)

...an efficiency gain of up to 10% can be achieved if the existing public operator in Sydney were to dismember its operations so as to reduce the size of each operations unit ... and to offer the supply of services to the private sector...

Hensher's adjustment factor for operating speed is used in Section 5 below to adjust Metro Vancouver costs in a comparison with Melbourne bus costs, to account for slower average operating speeds in Vancouver.

Hensher and Daniels (1995) examined the efficiency of public and private sector bus service provision in Brisbane, Sydney and Melbourne. Their work involved 24 private bus companies

from across the three cities and eight public operations. Using the partial cost indicator of total cost/km, they found public operators to be significantly more expensive than private operators, averaging 50% more expensive per kilometre. This cost difference was primarily due to higher labour costs/km. Using Total Factor Productivity (TFP) analysis, they found that private operators were 42% more cost efficient than public operators, in terms of gross TFP per vehicle kilometre.

Iseki (2010) noted that most US analyses of the cost savings from contracting out of in-house bus services used 'before and after' studies to reach their conclusions, typically finding cost savings of 10-40%. He undertook his own analysis, comparing systems that were fully contracted out with those where there is partial contracting and those with no contracting (i.e. where in-house service provision occurs). Iseki was particularly concerned about the possibility of 'selection bias' clouding findings about the efficiency impacts of contracting out of services. In particular, if public authorities whose in-house services cost the most tend to be those that are contracted out, biased conclusions are likely to arise in terms of the prospective efficiency pay-offs from contracting out. Iseki's study was designed to avoid this problem. Hensher's (1987) analysis reported above avoids this problem by comparing all public (in-house) and a range of long term private operators, to estimate relative efficiency(/cost) levels.

After controlling for a number of likely influences on service costs, Iseki (2010) concluded that contracting out of services (i.e., moving from in-house public provision to private sector provision) lowers operating costs by about 8% for partial contracting agencies and 5-6% for full contracting. The analysis concluded that savings were not universal but, for metropolitan type operation, depended particularly on the peak-to-base bus ratio and on the wage gap between bus operators in the private and public sectors. The savings for partial contracting were relatively larger because services that were the least efficient (e.g., services with the highest peak-to-base bus ratio) tended to comprise those that were contracted out within the service mix for the partial contractors. The order of magnitude of the savings estimated by Iseki are similar to, but slightly smaller than, those estimated by Hensher (1987).

Walter (2009) recently examined cost efficiency in German public transport, using Stochastic Frontier Analysis (SFA), a parametric benchmarking tool that compares various business units relative to their best-practice peer from within the sample analysed. He concluded that outsourcing contributes to efficiency improvement (but not nearly as strongly as the efficiency with which vehicles are utilised). The 'happy medium' in terms of overall efficiency was put at about 90% of best in class, which interestingly is consistent with results for German electricity and gas distribution companies (also local network monopolies, like local public transport services). In terms of dimensioning the scale of efficiencies likely to be available from private operation, rather than public, these results are consistent with those of Hensher (1987) and Iseki (2010) (i.e., up to about 10%).

Wolanski (2009) analysed the effects of outsourcing Polish route bus services, also using SFA (where his dependent variable was the cost of purchase or production of a bus kilometre of service). Wolanski justified a cost-based assessment of performance on the basis that it is the

authority that largely determines quality aspects of service delivery. His analysis found that the most efficient services were those provided by: (1) private operators where service rights were the result of negotiation and direct provision (i.e., not won at tender), albeit that this was a small group within his total sample; (2) followed by private operators where service rights were the result of a tender process; (3) then public operators who won their service rights in a tender process. The least efficient services were those provided directly by public operators.

Private operator efficiency levels in Wolanski's analysis, on average, were 9-14% better than efficiency levels for public direct provision, but with private direct provision showing a slightly larger efficiency gain (only small numbers in the sample). Wolanski only found one town where private operators were more expensive than public operators but this was in a town where the private operator provided only 0.5% of service and provided service to a specific market segment.   The analysis indicated that most private operators could still improve their efficiency levels, compared to best practice, but there was greater room for improvement in publicly provided services. Wolanksi notes that some public operators are very efficient but the balance favours private operation on efficiency grounds.

3.2   Comparisons Based on Switches from Public to Private Sector Provision (Franchising) (Before and After)

Wallis and Hensher (2007) is the most comprehensive and widely cited analysis of international research into the effects of privatisation (essentially achieved through competitive tendering) on route bus service provision costs. They analysed the impacts of a large number of competitive tenders (over 20) for urban bus services, across a wide range of countries (ten), from 1985. Their cost assessment focused on changes in unit gross costs, to normalise for changes in service levels and to avoid problems of normalising subsidies that are calculated on non-comparable bases (e.g. gross cost versus net cost). In summary, the cost reductions they identified from the *initial* round of bus service tenders were:

- Great Britain: 50-55 per cent;
- Scandinavia: most in the range of 20-30 per cent but a range from 5-34 per cent;
- USA: 30-46 per cent;
- Australia: Perth 22 per cent; Adelaide 38 per cent;
- New Zealand: c. 40 per cent ex public operators; c. 5 per cent private operators.

Wallis and Hensher (2007) also summarise the cost trends in second and subsequent tender rounds for urban bus services in five European countries where competitive tendering has reached this stage. They find that the evidence suggests significant real cost increases after the initial tender round figures. They acknowledge that, in some cases, this is attributable to more demanding contract specifications but they also suggest that it is due to several aspects of the competitive tendering model, including:

- the greater experience of bidders, resulting in more informed bidding, with less likelihood of bid errors or poor estimates (sometimes described as the problem of the 'winner's curse');
- less emphasis by incumbent bidders on retaining market share at all costs - an implication is that a number of initial bids were opportunistic and unsustainable;
- bidders taking a longer-term perspective, more often providing for asset replacement, with associated higher profit margins; and
- lesser levels of competition for tenders (in some cases). Wallis and Hensher note, for example, that the average number of bidders fell from six in the 1995 London bids to between two and three by 1997 and that, in New Zealand, the average number of bidders in tenders in the two largest centres had fallen to one in the early 2000s. This tendency reflects benefits of incumbency (including benefits of having access to information that is not available to others).

Wallis and Hensher suggest that the windfall gains in round one are primarily in going from public to private operators and that there is usually little more to save after that[2]. Interestingly, Wallis and Hensher note a convergence on cost levels by the third tender round in the Adelaide urban bus contract tenders, suggesting that efficient cost levels had probably been achieved. This conclusion is reinforced by the view of Wallis et al. (2010) that negotiation, rather than another bout of competitive tendering, is likely to be the most effective way for Adelaide to allocate its next set of rights to provide route services. This is partly a reflection of concerns that service quality suffered after round 1 and much of rounds 2 and 3 was used to sort this out.

Bekken et al. (2006) conclude that competitive tendering produced savings of about 10 per cent in Norway, which was less than most countries achieved. They attribute this smaller margin to a local private bus industry that had improved its efficiency over a long period of time before competitive tendering was introduced. This mirrors the New Zealand experience identified by Wallis and Hensher.   Bekken et al. suggest that the threat of competitive tendering was important in ensuring that cost savings were achievable in the Norwegian examples they review.

Beck (2010) reviews German experience with contracting out, using data that shows how little use has actually been made of this means of allocating the rights to provide route bus services in that country - most German bus services remain in public hands. From his analysis of contracting out in four regions, Beck found cost levels initially declining, with efficiency gains of 15-31%, but then stabilising and increasing, mirroring the findings of Wallis and Hensher (2007). Cost savings were mainly attributed to lower wage payments, where labour payments stabilised at private sector rates that were below public rates. Workload per employee also

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[2] Prior to franchising of Melbourne's rail networks, corporatization led to a significant reduction in cost levels. This reduction appears to have been ignored by franchisees, who expected much larger cost savings from their franchise than was achieved (Stanley and Hensher 2005). Performance-based contracts in public transportation: the Melbourne experience, in Hensher, D. (ed.), *Competition and Ownership in Land Passenger Transport,* Selected Refereed Papers from the 8th International Conference (Thredbo 8), Rio de Janeiro, Elsevier, Amsterdam.

increased. This reflects the initial British experience under economic deregulation of bus service provision.

Beck (2010) also found a tendency for global entrants to take market share and, unless tender parcels were kept small, a tendency for loss of small to medium sized operators. There was a tendency for the number of bidders to reduce over time. Innovation was found to be driven more by the authority's tender specification than by the operators' independent initiative. This reflects much Dutch experience.

3.3   Conclusions on Cost Efficiency

While the somewhat eye-popping figures of 20-50% cost savings from competitive tendering of previously publicly provided bus services encourages a claim for massive benefits of private provision, the evidence from cross-sectional comparisons is of smaller savings, of about 10% or perhaps a little less.   Selection bias is probably a major reason for the difference, services most likely to be competitively tendered being those that are high cost. However, the evidence of efficiency benefits from private provision is overwhelming, very few examples of public provision being more efficient than private having been identified in this literature review.

4.   Service Quality

Sections 2 and 3 of this paper introduced service cost and service quality as the two key dimensions on which route bus services are usually differentiated. Shleifer's (1998) expectation was that both would favour private sector provision, on the grounds of stronger performance incentives. Section 3 has argued that this private sector advantage seems to be borne out for route bus services. What about service quality?

Service quality has become a critical driver of public transport (bus) service expectations in most countries over the past decade, with a considerable literature having recently emerged on definition and measurement. This is increasingly being reflected in service contracts, where key performance indicators (KPIs) usually target specific aspects of service that are thought to be important for patronage growth and customer satisfaction, encompassing both physical aspects of service delivery (such as on-time running) and attitudinal dimensions (e.g. customer satisfaction with various aspects of service delivery), while also being under operator control or, at least, subject to substantial operator influence. However, while service quality is now a key focus of interest for authorities and service providers and is a usual component in contractual specification, there is no standard prescription of quality or expectation of what constitutes good quality. As a result of this learning process, quality expectations can sometimes develop during the course of a contract, reflecting the need to recognise incomplete contracts and a process for regularly refreshing contractual provisions during the contract period. Those who favour negotiated contracts argue that this form of contracting is more suited to the relational approach that this adjustment process requires.

4.1   QUATTRO

The EU Transport Research program provided an early focus on public transport service quality, through its QUATTRO[3] project (EU 1998). That project's final report concluded that (EU 1998, p. 7):

It appears that quality is one of the key dimensions in the provision of UPT that should receive more attention from authorities and operators in the future.

QUATTRO built on another EU research project, ISOTOPE[4], which found that the introduction of competition in the provision of public transport usually delivered efficiency improvements but that the impacts on effectiveness were far more ambiguous and "... that there was a need for remedies in quality flaws sometimes observed in the more competitive regimes" (EU 1998, p. 8). Van de Velde et al.(2008) reflect some of these lingering problems in their review of competitive tendering experiences in The Netherlands.

Table 1: The public transport quality matrix

QUALITY	1. Availability	1.1 Network 1.2 Timetable
	2. Accessibility	2.1 External interface 2.2 Internal interface 2.3 Ticketing
	3. Information	3.1 General information 3.2 Travel information – normal conditions 3.3 Travel information – abnormal conditions
	4. Time	4.1 Journey time 4.2 Punctuality and reliability
	5. Customer care	5.1 Commitment 5.2 Customer interface 5.3 Staff 5.4 Physical assistance 5.5 Ticketing options
	6. Comfort	6.1 Ambient conditions 6.2 Facilities 6.3 Ergonomics 6.4 Ride comfort
	7. Security	7.1 Safety from crime 7.2 Safety from accident 7.3 Perception from security
	8. Environment	8.1 Pollution 8.2 Natural resources 8.3 Infrastructure

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[3] QUATTRO stands for Quality Approach in Tendering Urban Public Transport Operations, a part of the EU Fourth RTD Framework Program.
[4] Improved Structure and Organisation for urban Transport Operations of Passengers in Europe.

With its focus on seeking to improve the attention given to quality in urban public transport, the QUATTRO study identified a number of key quality dimensions of public transport service, as shown in Table 1, which it argued could provide a basis for system improvement programs and for assessing the effectiveness thereof.

The listing of this set of indicators provides a hint as to why benchmarked information on public transport service quality is difficult to obtain.   The listing includes 8 categories of indicator (middle column) and 25 possible indicator areas in the right hand column. Each of these 25 indicator areas could include multiple possible performance indicators. Other possible indicator categories/areas could be added. Quality can be measured in terms of service providers or the customers, as elaborated further in Figure 1 below. The importance of particular indicator areas and specific indicators and performance targets within any area are likely to differ between jurisdictions, depending on history and starting positions, requiring (ideally) local data collection and modelling to identify key influences.   The cost of gathering such data can be costly. In short, comparing public transport service quality across systems and operators is far more complex than comparisons of cost per service kilometre or per service hour, which are themselves not simple! Notwithstanding such difficulties, it is now usual to see variants of the indicators in Table 1 used to benchmark operator performance and contribute to assessment of incentive/penalty regimes under service delivery contracts.

The QUATTRO project proposed a quality loop as a way of conceiving quality from Table 1. Figure 1 shows 'Delivered Quality' providing a basis for 'Operational Performance Indicators' (e.g. on-time running) and 'Perceived Quality' being used for 'Qualitative Performance Indicators', largely comprised of customer satisfaction measures. System performance is assessed on the right hand side and customer satisfaction on the left.

Figure 1: The quality loop at the level of the public transport system
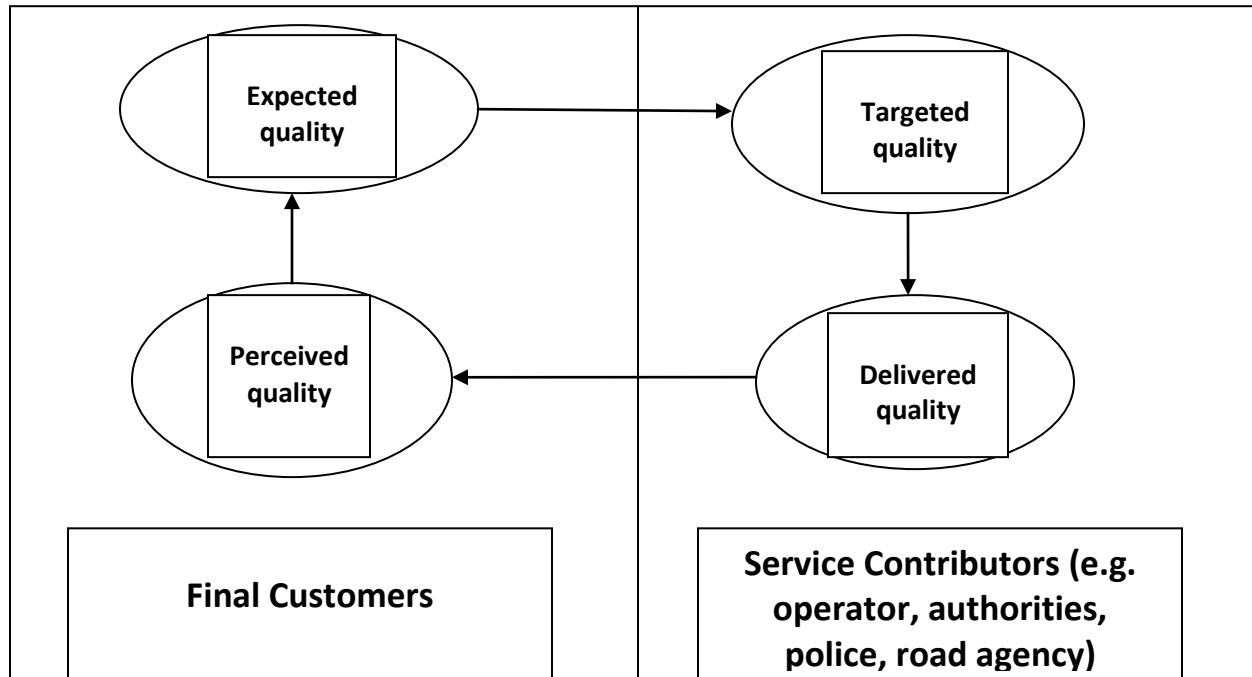
Source: EU (1998), p. 10.

4.2   BEST

A number of major public transport operators participate in benchmarking of their services, with a view to service quality improvement. However, the results of this benchmarking are typically kept confidential to the participants. One set of results that is not confidential is those of the European BEST survey (Benchmarking of Customer Satisfaction with Public Transport in Europe).[5] The annual BEST surveys report results for six European cities (Copenhagen, Geneva, Helsinki, Oslo, Stockholm and Vienna), for ten indicators of service quality. The ten indicators are: traffic supply; reliability; information; staff behaviour; security and safety; comfort; value for money; social image; and loyalty. Table 2 shows results for the six cities across the ten indicators.

The numbers in Table 2 show the proportion who indicated agreement with certain statements related to the matter indicator in question. A few indicators are selected for comparison with Melbourne data, because the indicators seem to be reasonably comparable to DOT Track Record measures of bus performance.

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[5] Material is available on the website http://best2005.net

Table 2: BEST survey results, 2010,

Index 2010	Vienna	Helsinki	Geneva	Stockholm	Oslo	Copenhagen	Average*
Citizen satisfaction	72	77	77	67	60	60	69
Traffic supply	64	67	68	60	59	56	62
Reliability	53	56	73	40	39	43	51
Information	53	46	71	40	44	45	50
Staff behaviour	59	59	74	55	67	65	63
Security & safety	74	76	74	69	84	71	75
Comfort	60	62	67	57	56	56	60
Value for money	42	51	36	39	37	28	39
Social image	81	87	87	85	88	71	83
Loyalty	72	80	75	62	60	47	66

Note: * This is an unweighted average.
Source: From BEST 2010, p. 6, with the average figures added.

Citizen satisfaction scores show the proportion who agree that they are satisfied (partly or fully) with public transport.   The range of BEST scores is from 60 to 77, with the unweighted average (rounded) being 69.   In other words, 69/100 respondents (from a survey base of 1000 in each city) were partly or fully satisfied with public transport.

DOT (2011) uses a different way of measuring customer satisfaction with Victoria's public transport, based on responses from interviewees being given a score of between 0 and 100 as per the following scale:

• Totally satisfied 100
• Very satisfied 80
• Somewhat satisfied 60
• Somewhat dissatisfied 40
• Very dissatisfied 20
• Totally dissatisfied 0

Using this scale, an index of overall customer satisfaction with Melbourne's route buses is calculated with the index being 69.3 in the October-December quarter of 2010 (69.5 in the previous quarter). This sounds very similar to the satisfaction level derived for 2010 in the BEST survey, although different measurement conventions make this an unwarranted conclusion. This simply shows the difficulty of benchmarking quality – consistent approaches are needed for useful benchmarking.

The Melbourne survey results can be analysed in another way. One Melbourne survey question on Overall Satisfaction with Bus Services is rated on a 0-10 scale. If scores of from 0-5 are treated as showing dissatisfaction and 6-10 satisfaction, then overall satisfaction levels with Melbourne buses were in the mid to high 80% range over the four quarters to September Quarter 2010. If scores of 6-7 are regarded as 'neutral", which DOT's behavioural analysts suggests is appropriate, then the satisfied rating falls to the low 50s. However, if scores of 7 are treated as partly satisfied, then satisfaction ratings (scores from 7-10) are about 70%, which is similar to the BEST survey average. A problem with such macro scores, however, is that it is not clear what drives the outcome, such that the policy and planning significance of the numbers is of limited worth. Indicators of more specific quality dimensions are important to deal with this problem.

Staff behaviour scores include responses to two questions: "The staff answer my questions correctly" and "The staff behave nicely and correctly". The rating of each system is a simple average of the proportion fully or partly agreeing with the two statements. The proportions agreeing range from 55 to 74, with an unweighted average of 63. The December Quarter 2010 index for customer satisfaction with staff behaviour on Melbourne route buses was 78, a strong result. Adjusting this for the different way of measuring customer satisfaction produces a 2010 average quarterly score of 62% satisfied, if scores of 8-10 on a 0-10 scale are regarded as satisfied, 90% if 6-10 scores are satisfied and 76% if 7-10 scores are regarded as showing some degree of satisfaction. This seems to be a little higher than the BEST survey results but questions are not the same and the BEST survey results are for all modes used by the operators in the respective cities, not just buses.

Security and safety ratings for the BEST benchmarked systems include responses to three questions: "I feel secure at stations and bus stops"; "I feel secure on board buses and trains"; and "I am not afraid of traffic accidents when using public transport". The unweighted average rating is 75, with the range from 69 to 84. The respective averages for the three component questions are 65, 75 and 85 respectively, the safety response pulling up the unweighted average for the category of three. Without that question, the security and safety average unweighted rating (which would then be mainly security) would fall to 70.

The customer satisfaction index for personal security on Melbourne route bus services was about 75 in December Quarter 2010, which compares favourably with the BEST results. Adjusting the Melbourne result to allow for the different way of measuring customer satisfaction produces a 2010 average quarterly score of 55% satisfied if scores of 8-10 on a 0-10 scale are regarded as satisfied, 85% if 6-10 scores are satisfied and 70% if 7-10 scores are regarded as showing some degree of satisfaction. This seems to be a little lower than the BEST survey results but, again, questions and modes surveyed are not identical.

4.3   Hensher's Service Quality Index (SQI)

Professor David Hensher has been interested for many years in combining attitudinal and behavioural data in travel demand models, using stated choice experiments to examine preferences for a range of attitudinal dimensions. In a paper under preparation for the Thredbo 12 Conference (to be held in

September 2011), he identifies 13 relevant service attributes from which he develops a Service Quality Index (SQI). This builds on his earlier contributions – see Prioni and Hensher (2000) and his classic piece Hensher and Prioni (2002) where the SQI index is developed and tested. This paper goes on to test whether operator service costs are affected by performance on elements of the SQI, particularly those component items that are thought likely to be under operator control. These might then be included in a possible contractual KPI regime. The 13 SQI variables measured by Hensher, in a NSW bus case study, are:

- Reliability
- Frequency
- Walking distance to bus stop
- Information at bus stop
- Travel time
- Bus stop facilities
- Walking safety
- Access to the bus
- Air conditioning of the bus
- Cleanliness of seats
- Fare
- Driver attitude
- Safety on board

The great majority of these are significant influences on choice. Some are subject to operator control or influence, others are not. Most are significant influences on cost and should be included in the operator cost function, so that the operator's efficiency or otherwise on service qualities under their control can be most effectively teased out. The Hensher approach has much to commend it for efficiency benchmarking applications and for future development of Quality-based KPIs in contracts.

4.4   European observations

The author and Chris Lowe, Executive Director of BusVic, held discussions with a number of European bus operators and regulators in April 2011, with service quality being a major focus of the discussions. While price was the central driver of choice of public transport service provider for early rounds of competitive tendering, the service quality offerings of providers has been gaining in importance as an influence on choice of provider. In jurisdictions where negotiation takes precedence over competitive tendering, and in places where the service provider remains a public entity, quality has again risen to the top in terms of intended service delivery outcomes.

The rise of service quality as a decisive criterion for public transport service provision, and for choice of provider in a competitive environment, is probably a reflection of two key factors:

1. a policy switch from service cost-minimising to social cost minimising on the part of many governments that partly fund public transport services, in recognition of the vital role such services play in reducing traffic congestion, lowering emissions (including greenhouse gas emissions), cutting the road toll and fostering social inclusion;
2. in those places where competitive tendering is used to select service providers, a tendency for costs to increase, after initial savings, such that purchasers are seeking to now get better value

for money (linked to the preceding point).

Quality has been a major focus of European public transport language for well over a decade, with European Commission transport research projects such as QUATTRO (see section 4.1 above) setting out well reasoned arguments why quality is important and listing a range of key quality indicators. All the agencies and operators visited remarked on the important role of quality in service planning and delivery, with the authorities indicating that it was a key criterion in choice of provider. For example, in Copenhagen, the bus authority Movia's business plan focuses on growth, quality and environment, with quality KPIs including passenger satisfaction and authority satisfaction. Overijssel Province in The Netherlands also uses customer satisfaction and authority satisfaction as performance (bonus/penalty) indicators.

The Copenhagen tender evaluation model weights price at about 40%, quality at 35% and buses at 25%, although there is some question about whether quality actually influences this degree of influence – price is still thought to dominate the selection process. In Malmo, customer satisfaction covers five things: punctuality; driver behaviour; information; quality of the bus; ride quality. It is arguable that the degree of operator influence over some of these variables is low, such that the indicator is a flawed measure of operator performance.

An interesting dilemma concerns the extent to which a public transport service tender document should spell out in detail what it means by quality and how quality will be treated in tender evaluation. The Stockholm approach tends to take a highly quantitative approach, setting out the various factors that are seen as important and the scores that will associate with various levels of achievement against each. Operators tend to like this approach because it provides some clarity in terms of how they structure their service offerings. This can then be followed through to KPIs that influence operator remuneration, such that quality impacts on both choice of provider and on subsequent remuneration.

In contrast, Overijssel Province is thinking of shifting to a much less structured framework. Their current awarding system uses a points-based approach. However, their team-based philosophy points in another direction, one that looks towards what an operator can bring to the table in terms of service planning, marketing and delivery within a team-based framework. In short, the focus is likely to shift to an operator showing what they are going to do and how. It is early days in terms of the working through of this thinking and in upskilling staff to judge bids on this basis but it may lead to some valuable insights into the qualities that should be sought in an operator in a context of relational contracting. Quality-based KPIs can, of course, still be developed and used to evaluate service delivery performance outcomes. This emerging experience could be very useful for thinking about future Victorian service development.

4.5   Conclusions on Quality

Quality is a vital but elusive concept in public transport, whose importance is high and on the rise. Difficult issues include, for example:

- whether to focus on production quality or on quality as it relates to customer satisfaction (e.g. how to clean a bus versus what the customer thinks about cleanliness). There is a distinct swing in Europe towards quality as it relates to *customer satisfaction*, since this is thought most likely to drive patronage gains, but both production and customer side measures remain important;

- no matter whether a production or customer satisfaction perspective is taken, which variables should comprise the relevant quality indicators and how should they be defined, measured and weighted? Consistent approaches to definition and measurement, in particular, are vital for effective benchmarking of one service/provider compared to another.

Authorities and operators are grappling with these issues and have a long way to go in terms of any consistent approach to quality. The range of quality variables included in service quality assessment is broadly consistent but measurement approaches differ and results are seldom openly published.

The limited data that has been assembled for this report suggests that Melbourne's bus services rate about in line with a number of major European public transport services on key customer service factors under operator control. The European services include both public and private operators. However, such comparisons are made very difficult because of the factors listed in the preceding two dot points.

Hensher's important current research indicates that both production and customer satisfaction indicators of quality should be included in an integrated approach to demand analysis, service costs and KPIs, if KPIs based on quality factors under operator control are to be included in contract remuneration arrangements. For bus services, the most critical quality variables seem to be (not in any particular order):

- Reliability
- Travel time
- Personal safety at the bus stop
- Bus stop facilities (shelter; seats)
- Information at the bus stop
- Service frequency
- Safety on board*
- Cleanliness of seats/vehicle*
- Driver behaviour*

In the Victorian setting, the asterisked items are those most under operator influence and, therefore, most suitable candidates for inclusion in a set of Service Quality KPIs. Other items may be suitable KPIs for agencies such as Metlink, DOT and VicRoads. The Overijssel Province practice of setting KPIs for both the operator and authority is strongly supported, because it increases the focus on a partnering relationship, which is likely to lead to the best value for money outcomes for the community.

Reflecting the production/customer satisfaction split, Victorian route bus contracts have made provision for Operational Performance Indicators and Qualitative Performance Indicators. These have not been specified in sufficient detail for implementation, although some preliminary work has been put into the OPIs. The nine indicators listed above could provide a basis for further discussions of suitable KPIs, with the asterisked items possibly forming the basis for discussion of possible KPIs for the Qualitative Performance Regime.

KPIs are particularly useful when they are able to be used for benchmarking purposes, since this enables efficient and inefficient performers to be identified. This is especially important in an environment where contracts are negotiated, because the KPIs provide a basis for transparently showing the efficiency of service delivery. Very little such benchmarking is published internationally, largely because

not much is done and the work that is undertaken is usually undertaken on a commercial basis for providers (some of whom may not wish to have their performance subject to widespread scrutiny!). Australia could take a lead by measuring and publishing service quality indicators, based on surveying across the major public transport networks. Hensher's SQI approach, linked to demand and cost modelling, is particularly suited to this work.

5.   Vancouver Bus Comparison

Melbourne competes with Vancouver in The Economist (and other) Liveability Rankings for title of the world's most liveable city. In the February 2011 rankings, Vancouver ranked first with a rating of 98 out of a possible 100, with Melbourne second on 97.5, marginally ahead of Vienna (97.4) and Toronto (97.2). Sydney, Perth and Adelaide also made it into the top ten (at 7th, 8th and 9th respectively).

Liveability ranking is an important part of 'brand Australia', in general, and 'brand Melbourne' in particular. It is important because it is a fundamental driver of the locational decisions made by the footloose skilled people who work in knowledge-intensive sectors, which are growth leaders. Melbourne's competition with Vancouver on Liveability rankings makes the choice of Vancouver interesting as a city with which to compare bus service operation.

Metro Vancouver is currently home to about 2.4 million people. Table 3 sets out some comparisons with Melbourne in 2006, when both Australia and Canada had an annual census. At that time, Metro Vancouver had 2.1 million people, just under 60% of Melbourne's population size. The age structure in Vancouver was slightly older than in Melbourne, renting was a more common form of home occupancy and apartments comprised a substantially larger proportion of the Vancouver dwelling stock (39.4%, compared to 16.1% in Melbourne). This suggests a higher density in Vancouver, which table 1 confirms.

Higher density usually means a higher public transport mode share and Table 3 indicates that 16.5% of Metro Vancouver residents travelled to work by PT in 2006, a little higher than Melbourne's 13.9%. Interestingly, the Melbourne PT overall mode share has grown much faster than the Vancouver share since 2006. In 2008, the overall PT weekday mode share in Vancouver was 12.5% (TransLink 2010a). VISTA indicates that Melbourne's overall PT mode share in 2007-08 was 13% and has risen further since that time.

Provision of bus services in Vancouver is the responsibility of Translink, otherwise known as the Greater South Coast British Columbia Transportation Authority. Bus services are provided by government entities, with Coast Mountain Bus Company providing about 95% of service for Translink. Translink bus fleet size is about 1550 buses, including 1078 conventional buses, 260 electric trolley buses and 133 community shuttles, operating on 200 routes. This is a little smaller than the fleet size for Melbourne's route bus services but Melbourne has more routes.

Table 3: Melbourne and Metro Vancouver: Some Comparisons

Indicator	Melbourne (Major Statistical Region)	Metro Vancouver
Population (2006)	3.6m	2.1m
Built-up urban area		
Gross density (persons/urbanised Ha)	15.7	17.2
Per cent of population aged:		
0-4	6.3	5.0
5-14	12.6	11.4
15-24	14.1	13.5
25-54	43.9	46.1
55-64	10.3	11.0
65>	12.8	13.0
Proportion rented housing (%)	26.6*	34.9
Apartments as % of dwellings	16.1	39.4
Average household size (persons)	2.8	2.6
PT mode share for journey to work (%)	13.9	16.5

Notes: * Calculated as a proportion of (rented/rented+owned).
Sources: For Vancouver, City of Vancouver Planning Department, *City Fact Sheets 2006*; ABS *Census 2006 Quick Stats*. Melbourne from ABS census.

Summary data on public transport costs and operating performance of Canada's public transport services is published annually by the Canadian Urban Transit Authority, the industry's peak body in Canada (CUTA 2010). The latest available data relates to 2009 but is too aggregated to identify the performance of individual cities. However, some noteworthy average figures for the largest Canadian cities (combined) for 2009 include the following:

- 106 public transport trips per capita; Melbourne 123 in 2008-09, according to Metlink, but this is likely to be boardings per capita, not trips per capita. PT boardings per capita in Metro Vancouver in 2009 were (not linked PT trips) were about 130. Melbourne's 2009-10 comparable boardings per capita figure was 125 from budget papers, which is very close[6];
- 60 service kilometres per capita in Vancouver (or 55 revenue service kms per capita); Melbourne 37, but with a much higher rail contribution, which makes the comparison somewhat misleading.

Table 4 presents some headline benchmark comparisons between the Metro Vancouver bus service and Melbourne's route bus services. The two services provide a remarkably similar number of service kilometres. The total budget cost of Melbourne's route bus services for 2009-10 was $461 million, including capital (e.g. bus capital costs) and operator margin, or

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[6] And so close to the Metlink figure of 123 for 2008-09 that it strongly suggests that the Metlink data is boardings per capita not trips per capita

$4.55/km. Metro Vancouver achieves a substantially higher boarding rate but has costs that are well above Melbourne's costs: $6.06/km compared to $4.55/km, a 23.3% cost advantage for Melbourne. If a purchasing power parity adjustment is undertaken, expressing both figures in US dollars, the rates become even more in Melbourne's favour, at $USD4.98 for Vancouver compared to $USD2.99 for Melbourne (a 40% advantage for Melbourne). The comparison is very complimentary to Melbourne's route bus service cost levels, since Translink prides itself on providing one of North America's most efficient public transport services (based on benchmarking reported in summary format in Translink 2009).

Some background comment is useful to put these comparisons in context. Bus transit operations expenditure for Metro Vancouver in 2010 is budgeted at $606.6m ($567.7m in 2009). Total transit operations expenditure was $820.2m in 2010, excluding Translink corporate costs and police. These figures show the relative importance of bus within the total Metro Vancouver PT offering, which is much greater than in Melbourne. Metro Vancouver public transport boardings are 70% bus.

As shown in Table 4, the Metro Vancouver bus operating cost per km was budgeted at $6.06/km in 2010. This unit cost, together with total bus operations expenditure of $606.6m, implies 100m service kilometres, as shown in Table 2. The Translink 2009 Annual Report (Translink 2009) suggests that the 2009 bus cost was $5.75/km. Translink (2010a) suggests that total bus operating costs increased from $567.7 in 2009 to $606.6m (budget) in 2010, an increase of 6.9%, and that service hours would increase by 0.12% from 2009 to 2010. With labour being the largest driver of bus costs (68% of operating costs for Melbourne route bus services, for example), these numbers suggest Vancouver unit bus operating costs may have increased by 6+%, which is close enough to the 5.4% increase implied by an increase from $5.75 to $6.06 to suggest that the 2010 figure of $6.06 is reasonable as a basis of comparison with Melbourne's costs. As indicated above, the comparison is very favourable to Melbourne.

Table 4: Some Metro Vancouver Bus Service Comparisons with Melbourne

Indicator	Metro Vancouver	Melbourne
Bus operating cost/km	$6.06	$4.55
Boardings/km	2.2	1.0 (2.2 inc tram)
Kilometres (m)	100	102
Average operating speed (kph)	19	22
Fleet size	1556	1714

Sources: Translink (2010a,b); Government of Victoria (2011); DOT website.

The boarding rate comparison shown in Table 4 is favourable to Metro Vancouver by a considerable margin: 2.2 compared to 1.0 (Melbourne's figure based on 2009-10 State Budget

data). The greater Metro Vancouver relative service presence in inner/middle areas, together with higher average urban densities (including greater presence of multi-level apartments within the dwelling mix) would help to explain this greater boarding rate in Metro Vancouver. For example, the average boarding rate per kilometre on Melbourne's trams is 7.9/km, with Melbourne tram and bus combined being 2.2, in line with the Metro Vancouver figures.

Operating hour data, together with service kilometre data, imply an average operating speed of about 19kms hour for Metro Vancouver bus services.   This is slightly slower than the Melbourne average of about 22-23kph, consistent with Melbourne's operation being substantially in middle and outer suburbs and Vancouver's relatively stronger presence in inner suburbs (associated with the lack of a tram service).   Hensher (1987) suggests that a 2 mph (3.2 kph) reduction in bus operating speeds will increase costs by about 12% (noting also that this estimate is subject to wide variation). Making allowance for a cost penalty effect of 12% for Metro Vancouver bus operations, because of the apparently slower average speeds than Melbourne buses, would reduce the Metro Vancouver average unit cost to $5.33, still almost $0.80/km more expensive than Melbourne. Metro Vancouver unit bus costs/km costs would need to fall by 15% to equate with Melbourne costs (assuming comparable cost definitions). Hensher's (1987) analysis of drivers of bus service costs suggests that the explanation for the Melbourne cost advantage will probably be found in the lower costs from private sector provision, together with the cost advantages from smaller firm size (multiple operators across the city, protecting against diseconomies of large scale).

6.   A Sydney Comparison

A March 2011 presentation by the Chairman of Forest Coach Lines in NSW, to a Chartered Institute of Transport and Logistics Forum on *Moving People,* enables a high level comparison of bus service costs in Melbourne and Sydney to be undertaken. Figure 2, taken from that presentation, shows that the average cost for Sydney route bus services, across the 15 service areas, was about $6.50/km, with the lowest cost in any particular area being about $4.80/km. Melbourne's average cost per kilometre of $4.55 is below the lowest average cost for any single area in Sydney and well below the overall average.

It will be recalled that, in Section 3.1, the affect of slow operating speeds in increasing cost/km was noted. Sydney's lack of a tram network means that buses play a larger role in inner metropolitan public transport than in Melbourne. This will increase costs/km for the services in question. However, the indication that no single Sydney bus franchise area achieves costs/km similar to Melbourne's average cost/km suggests Melbourne's performance is relatively efficient.

Figure 2: Bus Service Costs in Sydney

Key Performance Indicators for Bus Operators

Indicator: Cost Efficiency ➡ Cost ($) per Service Kilometre

- Why Monitor:
  ◦ Significant differences between operators (see cost per service km across Sydney Metropolitan Operators)

Average Cost per Service

Cost Service KM ($)

Region

A B C D E F G H I J K L M N O
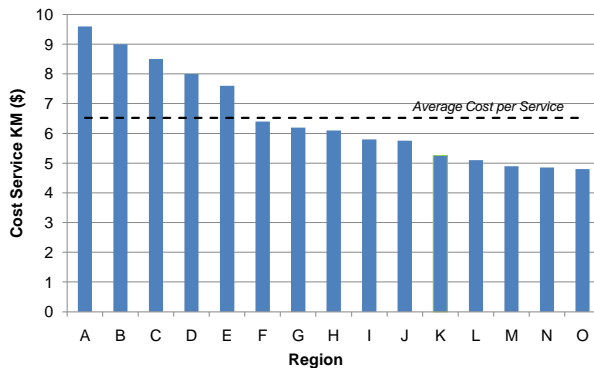
Source:
*NSW Transport &
Infrastructure 2010*

Are differences due to inefficiencies or are there other explanations like network speed?

Monitoring this indicator and benchmarking operators may provide answers

Source: Jock Murray, Presentation to CILTA *Moving People* Forum, March 2011.

7.   Conclusions

The data and research assembled for this paper has shown how little is yet known about many of the main issues of interest. The main findings can be summarised as follows.

Private sector provision of bus services is typically lower cost than public sector provision, by up to about 10%, with incentive alignment being the major reason for this outcome. Competitive tendering results are one source for this conclusion. However, these results are subject to the risk of selection bias, i.e. the least efficient public services may be those most likely to be tendered out and will show the biggest cost savings! Other benchmarking comparisons, which do not involve a tendering basis, however, are supportive of the conclusion about efficiency. While there will be public sector examples that benchmark very well, the key finding is that private provision is usually more cost efficient.

In terms of bus service costs per kilometre, Melbourne compares very favourably with Vancouver, its international 'competitor' in liveability ratings, and with Sydney.

Service quality is an important influence on public transport patronage and is of growing importance in a contractual setting. However, this is an emerging area, where norms of measurement are still being established. Melbourne's bus services appear to rate about in line

with a range of well regarded European public/private public transport systems in terms of quality factors under operator control/influence.

In a public transport service provision setting where the rights to provide service, and the remuneration for so doing, are the result of negotiation, benchmarking of service costs and quality, together with contractual KPIs that tie part of an operator's remuneration with their benchmarking results, is an important way to assure accountability and value for money. This also helps to guard against opportunism in a negotiated environment and to sustain competitive pressure. Australia should take a lead in benchmarking the cost and quality dimensions of its public transport systems, with Professor David Hensher's integrated demand/supply based Service Quality Index approach being particularly suited for this task.

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