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Optimal contracting and incentives for public transport in Sydney: what has been learned from the Sydney Metro experience?

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Abstract

The New South Wales (NSW) government created the Sydney Metro Authority to design, build and operate a completely separate underground Metro rail system to supplement the existing public transport network in Sydney. By the time the NSW government abruptly cancelled the entire Metro project in early 2010, the Authority had conceived and designed a contract that was proceeding to procurement. This paper examines the nature of the proposed Sydney Metro contract in relation to its performance framework and compares this to the frameworks in current contracts for bus, rail and ferry public transport in NSW. Against this background, the paper examines the extent to which the Sydney Metro approach has had an impact on subsequent public transport contracts in the context of the literature on optimal contracting and optimal incentives. The paper concludes that little has been implemented, although the other mode contracts now enable more performance measurement and incentivisation. In particular, the decision to award contracts to existing (and mostly public sector) operators appears to have acted as a brake on developing these performance elements.

1. Introduction

In November 2008, the New South Wales (NSW) government created the Sydney Metro Authority, a new agency tasked with designing, building and operating a completely separate underground Metro rail system to supplement the existing public transport network in Sydney. The Metro program was progressing to contract negotiations when the NSW government abruptly cancelled the entire Metro project in February 2010.

This paper is concerned with the performance framework embedded (or otherwise) in contracts between government and transport operators for the provision of public transport services. The first strand of this paper is a comparison between the contracts for other modes operating in the NSW metropolitan area of Sydney to identify the degree of commonality between the contracts for existing modes in Sydney and the new mode of underground metro. A second strand looks at the influence of the Sydney Metro Authority's contract development and considers the implications for future modal contracts in NSW.

A parliamentary information request and the public archiving of the Sydney Metro Authority's records following its dis-establishment has put the approach to the proposed Metro contract in the public domain. The generic bus contracts for metropolitan bus services have long been in the public domain. The rail and ferry contracts are not currently publicly available (they are expected to become available shortly under the *Government Information (Public Access) Act 2009*), although some information is available from other sources.

The next section considers the literature relating to optimal contracts and optimal incentives as underpinning the contractual relationship between operators and government in NSW. The paper considers the nature of the performance elements of existing modal contracts for bus, rail and ferry services in Section 3 and this is followed in Section 4 by an outline of the performance framework proposed for the Sydney Metro. This paper recognises that the bus, ferry and rail contracts are implemented whereas the Metro has not and may not have been implemented in the way portrayed in this paper if the Sydney Metro project had come to fruition. The discussion in section 5 relates issues identified by the optimal contract literature to the existing contracts in NSW.

2. Optimal contracting and optimal incentives

Worldwide, there is an increasing use of the "public-private partnership" (PPP) to deliver transport and other services. A PPP can be defined as a "contractual agreement between a public agency (federal, state or local) and a private sector entity. In addition to the sharing of resources, each party shares in the risks and rewards potential in the delivery of the service and/or facility" (NCPPP 2011). A broader definition refers to "working arrangements based on a mutual commitment (over and above that implied in any contract) between a public sector organisation with any organisation outside of the public sector" (Boivard 2004, p. 199).

When public and private entities 'blend' to work together to achieve a particular goal, the issue of governance immediately arises. Within private corporations, "corporate governance deals with the ways in which suppliers of finance to corporations assure themselves of getting a return on their investment" (Shliefer and Vishny 1997, p. 737). Within public entities, the issues are a bit more complex; good governance in that context aims to deliver goods and services cost-effectively and efficiently to constituents while ensuring adequate democratic process and citizen voice (Koppell 2003).

Much of the large literature on private corporate governance focuses on the agency problem and the related theory of transactions costs to discuss why the firm exists and what governance institutions are best suited to ensuring its efficient operation (Coase 1937; Fama 1980; Williamson 1988). There is an equally large literature on governance within the public sector, where the themes of 'networked' and 'distributed' oversight and accountability are emerging (Bovens et al. 2001).

The main justification for PPPs is that they create a synergy value that public ownership alone is unable to tap into. This synergy value is created whenever a combination of parties – involving government along with private operators, and/or non-profit organisations – combine to create financial or operational capabilities greater than any one party can provide alone (Weihe 2008).

But as noted above, there is an 'agency' problem: private and public parties do not typically have aligned interests (in economic terms, public and private 'objective functions' will generally differ from one another) and a governance structure must be designed to ensure both proper alignment and successful achievement of mutually desired outcomes.

Contracting is the primary way this agency problem can be resolved, if it is designed properly. A primary *public* objective of any contract is (or should be) 'Value for Money' (VfM), while a primary *private* objective is profit maximisation. How can a contract be designed to ensure such alignment and then successful achievement of contract goals? The 'optimal contracting' literature suggests three key questions:

1. Who are the relevant parties to the contract?
2. How can their interests and objectives be aligned in the contract?
3. How will the contract, once signed, be overseen and monitored to ensure optimal performance?

With respect to (1), Hensher and Houghton (2005) break down this question by categorising the different roles played by parties to the contract: government plays a strategic role; the regulator plays a tactical role; and the operator plays an operational role. These are generic categories and in reality may be combined in some cases (e.g., a single entity may contain both the government and regulator role). A very useful aspect of this schema is that it abstracts away from 'public' and 'private' to focus on roles that must be accomplished in any PPP. Specification of these roles and assignment of responsibilities for them are an important starting point to any contract and should be considered explicitly by all contracting parties.

The answer to (2) involves a number of dimensions which revolve around appropriate incentives. This paper focuses on two explicit incentive elements: performance payments and penalties (i.e. reward) and risk allocation. But implicit performance incentive structures are also relevant and include tender design, contracting process, contract term and institutional form; these will also be discussed below.

A key finding of the literature is that incentive payments and bonuses (or their inverse, penalties and abatements) are generally especially effective (and better than fixed payment schemes) in ensuring good performance in terms of outcomes (Hensher and Houghton 2005; Bloomfield 2006). Outcomes, such as improved access, mobility and service, are what any contract should aim for. Inputs such as increased spending or outputs such as more trains and buses, by themselves, are not desirable. Obviously the details of incentives must be carefully worked out and if poorly designed can lead to substandard outcomes.

The specific metrics chosen to award incentives and/or penalties are crucial. Examples of perverse incentives and unintended consequences arising from badly designed metrics in contracts are rife (Behn and Kant 1999; Skelcher 2005; Bloomfield 2006). Even if a metric is conceptually sound, there must be a robust process for measuring whether targets are being met and an adequate system for reporting results in a timely manner and to the parties most interested in optimal performance. In many if not most cases, this should include the users of a facility or service and possibly the general public who directly or indirectly are financing the contract itself.

The other side of performance is risk. There are a variety of risk types (revenue, cost, etc.). Just as interests of the various parties to the contract should be properly aligned, so should risk allocation. As an example, political risk should generally be borne by government, the party best able to bear it and most influential over its magnitude and incidence. Revenue risk can be more complicated. Uncertainty is part of any contract and it should not always be assumed that the operator should bear it in its various manifestations completely. It is important that each party should bear the amount and type of risk it is most efficient at dealing with and that risk-bearing should not create countervailing incentives to those contained in performance payments. A simple example of this is a contract which might have strong operator performance incentives explicitly but in which the government bears all the revenue and cost risk (Quiggin 2005; Ng and Loosemore 2007).

Implicit incentives and risk allocation can work against the explicit contract risk and reward provisions if not designed properly. Contract duration is extremely important. Long contracts might transfer effective control of an asset or service to a particular party even though nominal control or ownership might rest with a different party in the actual contract document. Long contracts might also reduce incentives for the operator to perform because they provide too much security of tenure. Some of this may be ameliorated, however, by having provisions subject to review and revision at specified periods (Ortiz et al. 2007; Kwak et al. 2009).

Identifying an ideal set of potential operators and then selecting the best one or several out of that set is equally critical. This comes down to the tendering process used, in particular whether bids are solicited and selected on a competitive or negotiated basis. The general evidence is that competitive tendering yields better contracting outcomes than non-competitive (negotiated) ones, though there are exceptions to this general rule (Hensher and Stanley 2003).

More generally, institutional arrangements are extremely important. With transport privatisation in particular, there is a difference between an actual gain in resources and a mere transfer of resources from one account to another. Some research on transport privatisation indicates that what are often seen as efficiency gains are really budgetary gains to the public authority that are achieved through losses incurred by other groups (Gomez-Ibanez and Meyer 1993).

So a question arises: is a government institution ('public') naturally better at some activities while private institutions are naturally better at others? Is a particular private-public blend best for a particular set of circumstances and what might those circumstances be? There is no simple answer to this question and it is not a major focus of the analysis here but is nonetheless important, especially when new institutions are being designed to carry out a particular contract or venture.

This discussion shades into key question (3), namely ensuring that the terms of the contract are satisfactorily carried out as originally intended by all parties concerned. Even a well-designed contract can be a failure if not properly implemented. Managing contracts, and in particular measuring, monitoring and reporting of performance incentives and payments, is a difficult issue in practice. Private sector investors need to ask questions about how cash flows and income are measured. On the public sector side, there is an additional issue about defining the public good and determining whether maximisation of shareholder value is consistent with maximum user value and value for the overall public. Maintenance of the public interest is a prime concern with any PPP. For any given project, the government must have a clear picture of its public objectives, and must devise contracts that ensure that these objectives will be achieved (Hodge 2004).

In general all contracting parties will want, generically, project success. This success consists specifically of an assurance that projects will be effectively designed with resulting services that will be efficiently implemented to provide a reasonable benefit or return to all intended parties. Initial performance measurement along all of these dimensions can help to ensure appropriate alignment of public and private benefits, and equity as well as efficiency in financing and pricing. It can also provide a basis for ongoing monitoring, which can potentially help to reduce or avoid shortfalls in any of the performance dimensions, as well as misalignment of performance among these various dimensions.

3. Existing public transport contracts for metropolitan Sydney

This section considers the contracts for the public transport modes of bus, ferry and rail which form the network of public transport services in Sydney. Table 3, located in Section 5, summarises elements of these contracts. Two other modes of public transport, light rail and monorail, are excluded from further consideration because the contents of the contract are not in the public domain and because of the very minor role they play in the public transport network. The light rail is privately run following complicated contractual arrangements completed in 1994 as a BOOT (*B*uild, *o*wn, *o*perate for a period of time before *t*ransferring the asset to government) (Mills 1997), and the same operator now operates the monorail.

3.1 Bus services

3.1.1 Background

Prior to 2003, the NSW government had contracts with 87 individual bus operators in Sydney. The government set the required service levels, frequency of service and hours of operation for regular bus services. The operator retained all farebox revenue and, in addition, received a payment from the government for student travel and concessionary travel. In 2003 the government commissioned a Ministerial Review of Bus services (Unsworth 2004). The terms of reference for the review included performance-related objectives including "funding, contractual and regulatory arrangements and any legislative changes required to implement these improvements" (Unsworth 2004, p. 93).

In addition to recommending changes to the metropolitan bus contracting areas and revised responsibilities for network planning, the review called for a new contracting regime for new, larger metropolitan contract areas. Contracts were recommended to include substantial performance elements and should be won by competitive tendering on cost plus other factors: “service planning skills; on-time running/reliability; environmental history; customer relations activities; and workplace relations, OH&S experience and proposed approach” (Unsworth 2004, p. 33). The review proposed that contracts should include standards for service quality, including “punctuality and reliability, timetable information, signage, customer relations/complaint handling, fleet specifications, and environmental performance” (Unsworth 2004, p. 34). It was noted that the implementation of the recommendations of the review would involve changes to the *Passenger Transport Act 1990*, as the Act did not give sufficient provision for “performance standards and penalties” (Unsworth 2004, p. 91).

Following the final report, the government accepted many of the recommendations and embarked on a Bus Reform program in 2004. Following enabling legislation amendments in 2004 and 2005, the 87 contracts with individual operators were rationalised to one contract for each of the 15 metropolitan and 10 outer metropolitan contract areas. Where a contract area had more than one operator, the contract was made between the government and a Management Board representing the relevant operators.

3.1.2 Generic 2005 bus contract

The metropolitan and outer metropolitan contracts cover the provision of bus services in each contract area for a period of seven years. The current template (often referred to as the ‘generic’ contract) for the metropolitan contract has two performance related payment mechanisms: the Operational Performance Regime (OPR) and the Service Quality Incentive (SQI). Neither of these mechanisms has been put into effect. Whilst the contracts for the metropolitan and outer metropolitan areas vary in some detail, they are identical in relation to the performance related mechanisms (NSW Ministry of Transport 2005a, 2005b, 2005c, 2005d).

The contract sets out the principles of the OPR and the rules for its formulation, calibration and implementation. The OPR measures reliability and punctuality of services through reviewing disruption to timetabled services. In addition the contract refers to, but does not specify, a cap on bonus and penalty payments. Any disruptions caused by ‘abnormal events’ (force majeure and other events beyond the control of the operator) are excluded from the measurement process.

The contract states that the Director General may award a SQI payment and sets out the measurement framework for the SQI. It contains six performance indicators with corresponding weights, listed in Table 1. The contract does not set out the details of how these components will be measured or any information on the likely scale of the payment.

Patronage growth is incentivised through a Patronage Change Payment which compares current year patronage, scaled by type and length of journey, with the previous year. The payment operates as a bonus/abatement regime: in cases where there is a decrease in calculated patronage the operator pays a penalty, although these bonuses/penalties can be accumulated over the years (NSW Ministry of Transport 2005b).

The contract also specifies four Key Performance Indicators (KPIs) which are proposed in the future to assess performance against compliance standards (NSW MoT 2005b). Failure to meet these standards would be taken into account in assessments associated with contract renewal (NSW MoT 2005a). The KPIs (and associated standards) are complaints management (falling numbers and response times), environmental protection (100% drivers trained), safety (100% drivers trained) and efficiency/productivity (5-10% improvement in revenue km per driver and total costs per revenue km).

Table 1 Metropolitan bus contracts: components of the Service Quality Incentive

Aspect of service quality	Measure(s)	Weight
Customer satisfaction	Staff helpfulness and courtesy Vehicle cleanliness Provision of Information Personal Security Service provision (where services go and when) Ticket machine availability and performance Overcrowding	50%
Complaints	Volume of complaints Response time	20%
Co-operation with Other Operators and the Community	Assessment by DoT through interviews with stakeholders and operator	15%
Load standards	Periodic reviews by DoT to measure capacity, especially at peak loading points	5%
Vehicle presentation	Periodic reviews by DoT of vehicle cleanliness and compliance	5%
Environmental performance	Periodic reviews by DoT of performance against plan	5%

Source: summarised from NSW Ministry of Transport (2005b) p.17-18.

3.1.3 Status

Progress on bus contracting was examined in a report by the Auditor-General NSW (2010c). The audit report notes that although the contracts were introduced as planned in 2005 (albeit on the basis of direct negotiation rather than competitive tendering), progress with incorporating performance elements had been slow. At the time of the report in March 2010, the government agency was in a position to monitor aspects of performance and quality but had not negotiated the structure of bonuses and penalties that would be used in relation to these measures. Although existing contracts enable operators to be penalised for poor performance, no penalties had been applied over the first four years of the contracts.

The audit report lists the six performance measures that were introduced and implemented in 2009, following a period of consultation which began in 2005: “cost per service kilometre; number of complaints; overall satisfaction from customer survey; service reliability; vehicle condition; and passenger boardings per service kilometre” (Auditor-General NSW 2010c, p. 16). Eleven further indicators “important to bus operations and to bus users” (Auditor-General NSW 2010c, p. 15) are proposed by the Auditor-General, without which “it is not possible to assess the efficiency and effectiveness of metropolitan bus services and it is much more difficult to identify specific performance improvements and performance failures” (Auditor-General NSW 2010c, p. 16).

3.2 Ferry services

3.2.1 Background

Most ferry services in Sydney are provided by the state-owned Sydney Ferries Corporation. In 2007, the government commissioned an inquiry into Sydney Ferries (Walker 2007). The acknowledged dominant purpose of the inquiry was “to report on action which should be taken to improve the ability of the Sydney Ferries Corporation (SFC) to provide safe, efficient and customer-focussed ferry services” (Walker 2007, p. 3). The impact of the lack of a contract was highlighted: “Sydney Ferries Corporation does not have a contract with Government which sets out the terms by which it should operate. With or without a contract, as a State Owned Corporation, SFC cannot be subject to any meaningful penalties for non performance or poor performance nor are there any real financial incentives to perform well” (Walker 2007, p. 1). The report looked at the relationship between SFC governance and performance, but cited difficulties with assessing performance, stemming from a lack of a performance management framework (Walker 2007, p. 150) and a workplace culture that

"significantly inhibits the capacity of the organization to achieve efficiency and service delivery improvements" (Walker 2007, p. 160).

With regards to contracting, the Walker report compared various potential approaches to promoting efficiency and quality through a contract with private operators, a state-owned corporation (SOC), or a public-private partnership. The report recommended that "the Government undertake to pay a price fixed by a service contract to a private-enterprise corporation for the provision of ferry services pursuant to a service contract as required by the Passenger Transport Act 1990 but on a provisional basis, that is, until it proves to be no more expensive than a SOC providing ferry services pursuant to a service contract as required by the Passenger Transport Act 1990 (Walker 2007, p. 334).

The report also lists legislative changes that would be required to enable effective contracting, including provisions to enable the regulator to offer or enforce incentives designed to ensure service standards (Walker 2007, p. 125-126). The report does not specify the types of standards or levels to be applied to these standards that should be included in a performance related regime.

3.2.2 Sydney Ferries contract

Following the Walker report, a market review was commenced in 2008, including a request for tender. Benchmarking the results of this exercise with SFC performance data led to a decision to sign a seven-year operating contract to SFC in April 2010 (Auditor General NSW 2010a). The contract is not currently publicly available, but the Auditor-General's report refers to details of the seven year contract (Auditor-General NSW 2010b): "The new service contract provides clear performance benchmarks for Sydney Ferries. Under the contract Sydney Ferries must continue its reform program, which includes cost reductions through restructuring, productivity gains through better work practices and improvements to safety and customer service". The report presents performance information and targets for 15 financial and non-financial KPIs (Table 2), but it is not known which, if any, of these KPIs form part of the service standards or part of the contractual incentive regimes (Auditor-General NSW 2010b).

Table 2 Ferry contract: potential performance indicators

Operational performance	**Financial performance**
Services that run on time (%) Patronage growth (%) Number of customer complaints Number of significant incidents Number of passenger injuries Number of sick days taken per employee Fleet availability (%) Vessel reliability (%) Number of passenger journeys (million) Patronage growth (%) Number of fleet failures	Earnings before interest, taxes, depreciation and amortisation Operating deficit Return on average assets (%) Return on average equity (%)

Source: Auditor-General NSW (2010b).

3.3 Rail services

Rail services in Sydney are provided by RailCorp through the brand name CityRail for metropolitan services. There was a Rail Performance Agreement for the period 1 July 2006 to 30 June 2011 between the Minister for Transport and RailCorp, but a new service contract replaced the agreement in 2010. The rail services contract required under the *Passenger Transport Act 1990* is not currently publicly available but is expected to be made available

under *Government Information (Public Access) Act*. However, the RailCorp Customer Charter (RailCorp 2011) contains 25 commitments in eight key areas: on-time trains; manage crowding; fast, accurate and useful information; safe and secure travel; clean trains and stations; fast ticket sales; quick and fair complaints handling; and accessible services and facilities. RailCorp provides a quarterly update on commitments on its website, although there is no publicly reported connection between the Customer Charter and the performance element of the rail services contract. The Independent Transport Safety and Reliability Regulator (ITSRR) (2010) reported on performance and noted a relationship between the rail performance agreement and the Customer Charter.

A very public element of RailCorp's performance has been on-time running, and its definition. The commitments are: to run more than 92% of trains on time on all lines, even at the busiest times, with less than 0.5% cancelled, and to stop at all scheduled stops at least 99.5% of the time. In July 2005, the on-time running benchmark for suburban services changed from three minutes and 59 seconds to five minutes. RailCorp publishes its on-time running performance daily on its website, as well as weekly, monthly and yearly data. As far as is known, RailCorp does not incur penalties or receive bonus payments related to its on-time running.

Under the auspices of ITSRR, Mejia and Lind (2009) conducted a review of best practice in rail contracting, presumably with the intention of setting some standards for the (then) forthcoming contract for the operation of the CityRail network. The review sets out the necessary elements of a commuter services contract including a statement of scope, objectives and contract term; clarity of roles and responsibilities; service levels, quality standards and requirements for integration; and mechanisms for funding, monitoring, reporting, incentivisation, dispute resolution and contract variation. Bonus and penalty regimes are cited by Mejia and Lind (2009) as a way to encourage contract compliance. However, they question the effectiveness of these in public sector contracting where the profit motive is not a strong driver. Their research also found that a collaborative relationship between purchaser and operator is an important facet of successful contracting.

4. The Sydney Metro contract

4.1 Background

The Urban Transport Statement (NSW Government 2006) introduced the concept of metro rail to link high demand corridors to major centres in Sydney and this initiated the process for investigating the viability and setting the agenda for metro development in Sydney. On 18 March 2008 the North West Metro was announced as the initial link in a metro network for Sydney but this was deferred in an announcement in November 2008 with a CBD Metro being then proposed as a first part of a staged approach to the metro network (Transport NSW 2010a).

A shadow operator was appointed early in the process through a process of open tendering to imitate the role of an actual operator and to provide the business plan and strategy underpinning the development of a contract for actual provision of the proposed link (Transport NSW 2010a).

The Sydney Metro contract information, as developed by the Sydney Metro Authority, is publicly available (http://www.transport.nsw.gov.au/sites/default/file/metrodocs/). All contract information described below comes from Schedule 3 of the proposed project deed (Transport NSW 2010b) unless otherwise referenced. The Sydney Metro contract was designed for a 35-year building and operating period by a successful PPP bidder (Transport NSW 2010c). The form of the contract was 'Design, Build, Operate, and Maintain' (DBOM). The successful bidder would have had responsibility for building the metro system (after the tunnels and station cavities had been constructed through a separate contract), sourcing and maintaining rollingstock and operational systems, operating the metro according to the specifications set out in the contract, and handing back the assets to the government at the end of the contract period.

4.2 The performance framework

Consistent with the theory underlying PPPs and performance contract incentives, the government department as contract holder would have controlled the quality of the metro and its services through a performance related payment mechanism. Parameters in the mechanism, in particular the bottom line operating fee, were to be proposed by competing bidders. In the bids, these fees were to be accompanied by design, construction and operating plans in sufficient detail to enable the government department to assess the long term viability of the bidding consortia (Transport NSW 2010c).

The Metro project was abandoned by government during the tendering phase. The following description is of a contract which did not come into effect. The payment regime for the operating period consisted of an availability payment to which modifications would be made in relation to operational performance. The main components of the formula were:

Service Payment = Availability Fee – Service Critical Abatement

+/- Patronage Payment + Service Quality Payment

+ Asset Management Payment.

4.2.1 Service critical abatement

The service critical abatement (SCA) would have penalised the operating company in cases where it failed to operate the Metro according to the specified availability and reliability standards. These standards were set out as a timetable, which was in the form of 'trains per hour' across different daily operating periods. The contract also sets out a process for the number of trains per hour to be amended at the behest of the NSW government. In order to ensure a regular and effective service within the current timetable, the SCA was composed of three measures: service delivery, service reliability and journey time.

Service delivery was measured by the amount of trains run in each of six weekday and three weekend operating periods. Payment would be abated for each operating period in which the operating company failed to run the specified number of trains. For example, the evening period lasted four hours, and 12 trains per hour were specified in each direction. In principal abatement would occur if the operating company ran less than 96 trains over the four hour period. In practice a small amount of tolerance was built into the contract.

Service reliability was designed to ensure an even supply of metro services across time. It was measured by 'missed headways'. The timetable specification of trains per hour implied an average headway for each operating period. In the example of 12 trains per hour, this average headway would be five minutes: the service critical abatement would be applied on occasions when any headway was above five minutes plus a tolerance of 45 seconds.

The third element of the SCA measured *passenger journey times*. The first two measures would have helped to ensure a consistent service for passengers. However, they provided no incentive for the operating company to run trains at a reasonable speed. In fact, since fuel costs increase with greater train acceleration and operating speeds, the operating company might have had an incentive to run the trains as slowly as possible. Hence this third measure, which aggregated all journey times between combinations of arrival and destination points, and compared this with benchmarked aggregated times. Abatement would be imposed if the discrepancy was above a tolerance.

The SCA was to be calculated daily, and its calibration was not linear. Any day with more than 99.4% performance, based on a weighted average of the components, would attract zero abatement. The marginal level of abatement was greater at high performance levels (85% up to 99.4%) than at lower performance levels. The contract also specified a point below which consistently poor performance would be deemed unacceptable and would constitute a default of contract (Transport NSW 2010c). The SCA calculation also made provision for various special cases. For example, additional abatement would be caused by a service interruption (defined as any station receiving no metro service in one or both

directions in any 15 minute period), and during periods of planned maintenance the level of abatement would be reduced.

4.2.2 Patronage payment

The patronage payment (PP), labelled 'Customer Acceptance and Integration Payment' in the contract documentation, encouraged the operating company to ensure that design and operation of the metro was geared towards patronage growth. The payment was assessed by measuring actual patronage against a benchmark, which was recalibrated every three years. The PP had a maximum upside for the operating company of $2m per annum which, as the annual cost for stage 1 of the metro was estimated at $50m (Transport NSW 2010d), represents a maximum upside of 4% of the contract cost. This element of the payment regime was to be the subject of discussion and refinement during the tendering process, and reviewed after 10 years of metro operation (see Ortiz et al. 2007; Kwak et al. 2009).

4.2.3 Service quality payment

The service quality payment (SQP) was a sum to be added to the availability payment, to a maximum of $5m per annum which, as the annual cost for stage 1 of the metro was estimated at $50m (Transport NSW, 2011d), represents a maximum upside of 10% of the contract cost. The actual payment was determined through a weighted average of scores on twelve service quality KPIs, summarised in Table 3.

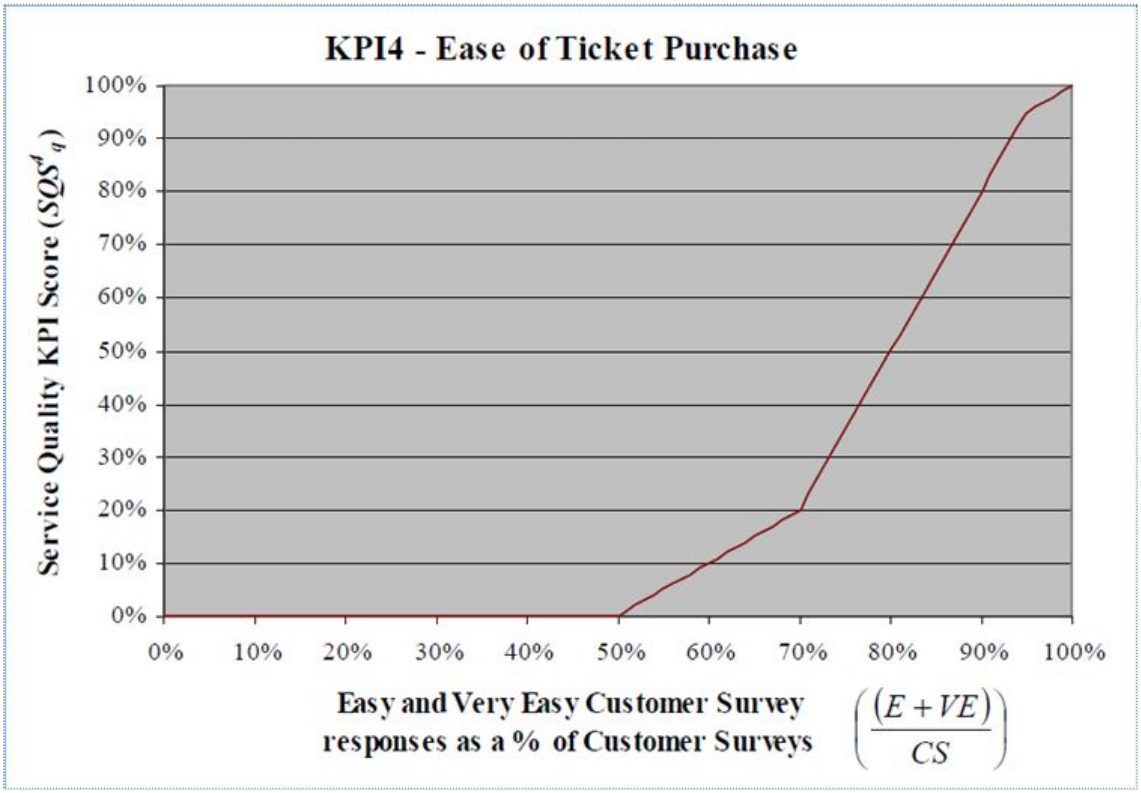
Table 3 Components of the Sydney Metro Service Quality Payment

Service Quality Measure	Measurement method	Weight
Passenger safety	Passenger survey	20%
Ride quality	Passenger survey	10%
Provision of information during service disruptions	Passenger survey	10%
Availability of customer assistance	Mystery shopper	10%
Ease of purchasing a ticket	Passenger survey	8%
Cleanliness of stations	Inspection by third party	8%
Cleanliness of trains	Inspection by third party	8%
Evidence of graffiti and vandalism	Inspection by third party	8%
Temperatures in stations and trains	Operational systems	8%
Availability of escalators	Operational systems	4%
Availability of CCTV	Operational systems	4%
Availability of lifts	Operational systems	2%

Source: Transport NSW (2010b) p 30

Each measure in the SQP was calibrated so that marginal payments were greater at higher performance levels. For example Figure 1, taken from the Metro contract documentation, shows the profile for scores in the customer survey on 'ease of ticket purchase'. The measure was the proportion of respondents who replied 'easy' or 'very easy' in a five-point scale to the question 'how easy was it to purchase your ticket?' If this proportion was less than 50% then the KPI would not qualify for payment. A score between 50% and 70% could attract up to 20% of the maximum possible payment, and a score over 70% up to 95% would earn greater marginal payment for each percentage point improvement.

Figure 1 Example scoring profile for Sydney Metro service quality



Source: Transport NSW (2010b) p. 37.

Payments were to be made quarterly; in cases where sampling volatility was expected the measurement was converted to a moving annual average. The contract documentation includes a large amount of detail on measurement methods and governance of the measurement processes, probably for the purpose of transparency. The contract also sets out rules for consistently unacceptable service quality performance, which would lead to a default (Transport NSW 2010c).

4.2.4 Asset management payment

The final component of the service payment related to the maintenance of the metro assets. The operating company was to be responsible for maintaining these assets to an expected condition. The government would assess asset condition through an inspection regime, and withhold a proportion of the service payment if the condition of any assets was not as expected with respect to their asset life cycle. The withheld payment would be paid when the faults had been rectified.

4.2.5 Other payment mechanism provisions

In addition to performance-related payments, the final service payment was subject to two further amendments. Firstly, a 'Reporting Failure Amount' was specified to penalise the operating company if it failed to provide auditable information in relation to any of the specified performance measures. Measurement of all of the service critical KPIs and four of the service quality KPIs depended on the operating company's systems. Secondly, the bidding process allowed the operating company to opt for either a fixed or floating rate for calculation of the service payment, since the payment was in part repayment for the initial design and construction phases.

5. Discussion

5.1 A comparison of the different contracts

Table 4 provides a comparison of the different elements of the contracts identified in the different sections above. The four modal contracts (three implemented and one proposed) were designed to meet differing circumstances. In particular, the operating environments of the four modes had markedly different histories and this naturally will have affected the approach to contracting. The Sydney Metro project had no antecedent organisational issues to be taken into account: it was effectively a 'greenfield' project. The appointment of the shadow operator and the creation of an almost 'arms length' separate Authority suggests that there was an intention to start anew in the development of a contract and operating environment. In contrast, contracts for the three existing modes were subject to prior government or independent inquiries before implementation: the Unsworth review for buses and the Walker review for ferries. Although no formal review has been found for rail, rail operations and performance had been subject to annual reviews by the Independent Pricing and Regulatory Tribunal in fare determinations and ITSRR.

Table 4 shows some key differences between the contracts. Only buses were not in a monopoly operation situation. Whilst the contract length for the Sydney Metro was proposed as 35 years, those for existing modes have been much shorter at 7 years. The nature of the contracts is different too with the metro contract being a DBOM and the others resembling operating only contracts: this will undoubtedly have had an impact on contract design. The stark difference highlighted by this table is the clear specification of the Metro contract elements in contrast to the contracts for the other modes. Table 3 also highlights similarities and shows that there are greater similarities between the contracts for rail and ferry, as state-owned assets as compared to the mixed ownership structure observed in the bus industry and the private ownership proposed for Metro.

5.2 Performance frameworks and relationship to optimal contracts

A theme of this paper is the degree of integration of transport contracting across the four modes within NSW in their approach to performance specification and incentives. If this is the case, then some evidence of sequence would be expected: the more recent contracts were developed in the knowledge of what had gone before and therefore would contain some evidence of learning from the earlier ones. The sequence for the four contracts considered here is: bus (2005); metro (2009); ferry (2010); and rail (2010). The evidence of section 3 and section 4 suggests that there are significant differences between the existing mode contracts and the proposed contract for metro. These are discussed in turn below.

Table 4 A comparison of the contracts for Bus, Rail, Ferry and proposed Metro in NSW (as of 2011)

Comparison	Bus	Rail	Ferry	Metro (proposed)
Description				
No. of contracts	15 metropolitan	1	1	1
Term	7 years (2005-2011)	7 years? (2010-2016)	7 years (2010-2016)	35 years
Procurement process	Negotiated	Negotiated	Negotiated	Competitive tender
Basis of contract	Service operating, vehicle maintenance	Service operating, infrastructure and rolling stock maintenance	Service operating, vehicle maintenance	Design, Build, Operate, Maintain
Contract originator	NSW government	NSW government	NSW government	NSW government
Contract	State Transit Authority and private operators (eg Busways, CDC, Forest, Area 4 Management Co)	RailCorp	Sydney Ferries Corporation	Private operator, probably a consortium of private companies to provide necessary skills
Asset ownership	Private and state-owned	State-owned	State-owned	Private with provision for transfer to State ownership at end of contract
Performance Elements				
Reliability (service critical abatement)	Bonus/abatement provisions in generic contract but not currently implemented	Unknown but unlikely	Unknown but unlikely	Non-linear daily abatement regime -100% to 0%
Patronage payment	Generic contract provides for bonus/abatement regime. Varies by operator	Unknown but unlikely	Unknown but unlikely	0% to 4% (estimated)
Service quality payment	Provision made in contract but not implemented	Unknown but unlikely	Unknown but unlikely	0% to 10% (estimated)
Incentive as % of contract value	Not known	Not known	Not known	-100% to +14% (estimated)
Asset maintenance	No	Unknown but unlikely	Unknown but unlikely	Yes
Reporting of operating performance	Not public	On-time running on website (by line, by week, by time period) Annual Report	Annual Report	Not known
Reporting of customer satisfaction	Public	Public	Public	Not known

5.2.1 The nature of the contract

The Unsworth review (Unsworth 2004) recommended competitive tendering for the bus contracts subsequently introduced in 2005. The government took the view that the public interest would be better served by a negotiated contract process that took account of existing operators in each area. Performance in these new contracts was proposed as a yardstick for determining whether future contracts would be negotiated or put out for competitive tender. Competitive tendering was similarly proposed for ferries (Walker 2007), but a market review in advance of the contract preparation concluded that the private sector could not match the existing public sector operator (SFC) on a combination of price and quality. This was subject to debate in Parliament where the opposition (now the NSW government) identified their intention would be to franchise ferry services (NSW Parliamentary Hansard, 22 June 2010).

On 11 May 2011, the new government announced that they were to start this process (NSW DoT 2011). In the case of ferries there was also considerable public opposition to 'privatisation' especially a campaign built around Sydneysiders' sentimental feelings towards the long-standing harbour services (see for example www.saveoursydneyferries.org.au). As a special case, however, the NSW government did undertake a competitive tendering process for the separate fast ferry service connecting Manly and Sydney CBD. In contrast, the Sydney Metro contract was conceived to be a competitive tender process and there is no evidence, even though the contract has not been implemented, that the NSW government had intention to vary this aspect.

The current Rail Clearways infrastructure program is designed to give separate pathways for freight and passengers and allow the sectoring of services. This would allow a future NSW government to create separate infrastructure and operating contracts in the future as has been common in European railways.

However, the focus of this paper is on the performance elements of the contracts. The success of the performance incentive regimes depends on a number of factors and these are discussed in the next sections.

5.2.2 Time and duration of contracts

The form of any contract has an effect on the approach towards performance. The design-build-operate-maintain (DBOM) form of the Metro contract – possible because it was a greenfield contract – meant that operating performance (reliability and quality) could be influenced and potentially enhanced during the design and build stages before any services were run. As the other three contracts are essentially operate-maintain or operate only in form, their performance frameworks need to take into account legacy infrastructure and vehicles which act as constraints to potential performance for example, through bottlenecks and unreliable vehicles.

DBOM contracts by their nature need to take a longer term approach, not only to allow the infrastructure to be built but to enable the supplier to recoup capital costs, through either the fare box or government payments. This explains why the Metro contract was for 35 years, compared with 7 years for bus, ferries and rail. But the length of contract does of course have an impact on asset ownership issues. For Metro, ownership of the assets would be vested in the NSW government and be used by the operator for the duration of the contract. As state owned assets, the ownership of ferries, trains and the part of bus operations provided by the State Transit Authority were in public ownership at the time of contract issue. However, the asset ownership aspects of the bus contracts with private operators are not clear: operators owned their own vehicles and bus depots at the start of the contract but have received funding for new vehicles under the contracting regime. The long term status of vehicles and depots and how these could/would be treated if contracts were to change hands is the subject of ongoing discussion.

5.2.3 Incentives

The size of the potential bonuses and abatements in relation to the overall value of the contract will have an impact on an operator's ability and willingness to fund quality services. The survey of European urban transport contracts identifies a wide variation, from 0% up to 21% (European Commission 2008). The majority of contracts have provision for termination and so in principal there is potential for 100% abatement. The European Commission study found the maximum operator risk was 21% of operating payments if normal operations are assumed. In comparison, the Metro contract proposed a situation where there was potential for 100% abatement on any day with accompanying discussion estimating that potential bonuses were of the order of 14% of the contract. The size of the incentive or abatement is not clear in the other contracts, even where private bus operators are involved.

It must be understood that contracts need to recognise that the operator and contracting authority will have different objectives. As the literature identifies, the private operator will be driven by returns to their stakeholders, in particular profit-driven dividends to shareholders. In the case of a public sector operator, the difference is more subtle but will still exist. A large public sector operator may, for example, be as much interested in protecting its monopoly position as if it was in the private sector and less interested in providing quality services for customers. These asymmetries in expectations between parties require detailed contract drafting. In particular there needs to be a clear understanding as to what is required at signing and a detailed mechanism for reaching agreement for those issues to be agreed post-signing. The Metro contract appears to be more precise in its specification of the detail than the other modal contracts with little left to be agreed post-contract signing. In contrast, the bus contracts left a good deal to be agreed later for performance related elements and there is evidence that progress has been slow.

Successful contracting also depends on the degree to which the mechanisms in the contract accurately reflect stakeholder expectations for passenger experience. Assuming that market research has been successfully carried out, it is likely that an incentive regime based on measures of outcome is more likely to match customer needs than one based on input measures. Outcome measures also transfer more risk to the contract holder by recognising that perceptions of the customer may be influenced by more than operational measurements. Of the four modal contracts, it is clear that the Metro contract was the most precisely specified in relation to performance and more related to output measures.

In addition, the KPIs used in the incentive regime must be carefully balanced to ensure that the complex – and sometimes conflicting – needs of all stakeholders are met. Over the period of the contract the operator will be incentivised to do anything possible (within the spirit of the contract) to maximise its own objectives. This may be at variance to the needs of other stakeholders. For example, if a contract were to focus on a single performance measure such as on-time running, the operator has an incentive to amend the timetable in a way that would ensure high scores on the measure. Moreover, 100% performance on this measure would not necessarily lead to a positive passenger experience.

5.2.4 Risk

In a well defined contract, the incentive regime will be clear as to how the risk is allocated between the contracting authority and operator. Performance attributes which attract bonus or abatement payments provide the allocation of risk. The Metro contract put most of the risk onto the operator: although there was a cap on quality bonus payments which limited the risk of additional payments to the government, the abatement regime for the operator was total. In the bus contracts, there is provision for the government and operator risks to be symmetrical with regard to patronage growth, for a bonus only regime in relation to service quality but with a cap on bonus and penalty payments for operational performance. As the literature identifies, allocating risk between a government contracting authority and public

sector operator may not be appropriate, as the payment of bonuses and abatements could result simply in transfer payments between the operator and government.

6. Conclusion

The discussion in this paper concentrates on the performance frameworks of the contracts for four different modes in Sydney. It is acknowledged that these contracts will have some mode specific and some location specific aspects. Nevertheless, there are some general conclusions from comparing contracts within the same location which are not possible with a comparison of same mode contracts between locations.

In NSW, where there have been independent inquiries prior to contracts being signed, these have recommended competitively tendered contracts. However, for bus contracts there has been no public explanation of why these recommendations were not implemented. In the case of ferries, a market testing process fulfilled this role and led to the negotiation of contracts with the incumbent, state owned operator. In contrast, the Metro contract was in the process of being competitively tendered when the Metro was cancelled, suggesting the NSW government was not averse to competitive tendering per se. It is an open question as to whether negotiated contracts have provided as good an outcome for passengers in NSW as compared to a competitively tendered alternative.

The contracting literature suggests that better contracts will have a close relationship between the objectives of the contracting agency and the detailed workings of the performance incentive mechanism. This requires a contracting environment where there is trust and dialogue between the parties and this in turn depends on the nature of the contract. More important perhaps is that contracts need to make responsibilities clear if integration and co-ordination is to be successful. The experience of London Underground and Metronet shows how quickly a breakdown of communication can lead to contract difficulties with adverse outcomes for passengers (Transport for London 2008).

The chronology of the contracts for Sydney also reveals evidence of experience being transferred between the different contracting exercises, with concepts in the bus contracts on reliability, quality and patronage incentives also being part of the proposed Metro contract. However, there are also significant differences: the performance framework proposed for Metro is clearly specified and largely outcome based with better specified reporting arrangements than any of the other contracts. Whilst this may have been driven by the need to provide a contract that could withstand 35 years, it is clear that this clarity in contract delivery for performance frameworks has not been integrated into contracts formulated post Metro. In the run up to the renewal of the expiring bus contracts for metropolitan NSW, there is a need to wait and see if the experience of clear and largely outcome-based performance measures, as proposed in the Metro contract, will be integrated or ignored.

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