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Workshop 1 Report: Developing an effective performance regime

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ABSTRACT

This workshop discussed the challenges faced in developing performance regimes: in particular, the way in which public transport authorities secure the performance of their operator(s). Earlier Thredbo workshops focused mostly on setting and measuring performance standards and incentivizing performance. This year's workshop also looked more widely. The first additional topic was the context in which the performance regime is operating: how well is the market developed and what consequences does that have for the regime? The second was the maturity of the regime. Which conditions have to be fulfilled to have a fully-fledged and mature performance regime? These questions were addressed based on papers (and workshop participants) discussing performance in Australia, New Zealand, Japan, Greece, France, Ireland, Sweden, The Netherlands, Chile and Latin America more widely, and The United States. Key findings are that a wider set of conditions has to be in place to make a performance regime work. Appropriate technology is needed to capture good quality data. Mature institutions – that is, with the necessary legal powers to enforce contracts, guard against capture by the operators, and with appropriate staffing and resources – are also crucial. Maturity differs widely in the countries covered in the workshop, and thus different solutions are needed in different contexts. In particular, in situations of "low maturity", regimes that place greater emphasis on passenger/demand metrics are likely to be more appropriate. The distinction between enforcing and incentivizing is also important in developing an appropriate performance regime. A suggested analytical framework for an effective performance regime which takes account of the above factors is set out, together with areas for future research. Obtaining greater information on the marginal costs and benefits of improving performance and also how better to benchmark complex and diverse operations against each other are key areas for future research. Other key research needs identified include: how to strike the right balance between enforcement versus seeking improvement; operationalizing KPIs (e.g. targeting frequency versus punctuality); and understanding real as opposed to assumed behavior by authorities and public and private operators.

1. Overview of the papers presented

Based on evidence from France, **Faivre d'Arcier and Bouf** show that tendering of entire networks has not brought about the efficiency gains expected. They point out that operating costs per trip have risen substantially from 1980, far more than the growth rate of fare box revenues. Often, the high level of subsidies is legitimized on the basis of other public values (Veeneman, Van de Velde, & Lutje Schipholt, 2006). However, the real performance with respect to these values is often unclear when making alterations to the network. **Faivre d'Arcier** suggests evaluating the performance of public transport in more detail, taking account of a wide range of public values (e.g. environmental performance). In the presented approach the performance of each line in a network on various public values is modeled and presented to decision-makers. This allows the authority and operator to change the services, incorporating the performance of the various lines on patronage, cost and revenue, but also on CO_2 emissions or car kilometers avoided, all on a line-by-line level. It represents one of the examples of the broadening of performance regimes seen throughout the workshop. A key challenge though is whether measuring line by line performance conflicts with the need to consider overall system performance, given that ridership on one line affects usage on others.

Batarce and Galilea, **Gómes-Lobo and Briones**, and **Melo** all look at the development of the performance regime in Transantiago. They show how a contracting strategy and its performance rely heavily on monitoring. They see the most effect from the first

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steps to introduce stronger management of compliance, with later steps having less effect. Batarce and Galilea show the dependency of gross-cost contracts on sound monitoring and monetizing. Gómes-Lobo and Briones note the positive effect of putting some demand risk on to the operator, even in gross-cost contracts. Melo shows that the increased focus on compliance in Santiago has indeed increased the quality of service by reducing waiting times for travelers.

Like Batarce and Galilea, **Georgiadis et al**. use data envelopment techniques to come to their conclusions. Data envelopment analysis can be used to perform a more integrated analysis of the performance of various operators or lines. Georgiadis et al. were able to incorporate the effect of population density and traffic conditions in the evaluation of lines and point at the possibility to reduce vehicle size as a promising efficiency improvement in the bus network of Thessaloniki. Together with the approach presented by Faivre d'Arcier, this could provide an integrated line-by-line evaluation tool to optimize the overall performance of the network.

Tribone et al. show how the set up of data analysis and visualization has to align closely to the needs of those intended to use it. On the basis of a case study of the punctuality on the Boston Redline metro, they show how the translation from data to performance metrics is best developed in close cooperation with those operationally involved. **Van Oort** also looks at punctuality; however he focuses on the way in which this is set into the contract. His conclusion is that the performance management of punctuality focuses too often on the vehicles, rather than on the effects on the passengers. Van Oort proposes ways to improve on that, for example by focusing on regularity rather than punctuality on short headway services. Like Van Oort, **Wretstrand et al.** show how a limited system boundary of a performance regime can lead to sub optimization (for example, it is important to consider the overall safety performance of a mode, including incidents that occur when walking to a bus stop). Looking at safety for the traveler, they show how widening the analysis towards sidewalks and stop design could optimize overall system performance in a more efficient way.

Veeneman et al. show the effects of tendering in the Netherlands and the performance of various contracts, also using a data envelopment approach. The conclusion is that non-tendered concessions have improved their performance faster than tendered contracts. This is not an effect of the direct awarding approach, but of the higher potential for improvement these concessions had, being in the major Dutch cities, which traditionally had low cost efficiency. The realistic threat of tendering was as effective in terms of improving performance as tendering itself. **Hewitt** also shows how tendered and non-tendered concessions interact in Wellington and how the possibility to tender can be used to improve performance. The Wellington authority ranks its operators, to allow the best performers on cost-recovery to keep their concessions. This case, and experience from the workshop more widely, emphasizes the greater importance that performance ought to play in the re-award process – this important incentive mechanism is generally seen as being largely absent in many cases around the world.

Finally, **Tiznado et al.** presented a paper focusing on the incentives of bus drivers, rather than bus operators. They found that drivers preferred to be incentivized on operational performance rather than passenger satisfaction – though it is suggested that such measures be incorporated into driver incentives (recognizing that part of the problem is that drivers do not fully understand the implications of such measures for their remuneration).

2. Discussion

This section is structured as follows. The workshop identified the context and degree of maturity as being very important in determining the optimal performance regime to implement. These are discussed first. We then discuss the relationship between the operator and authority, highlighting a number of trade-offs that need to be considered. We then set out an analytical framework for an effective performance regime, before setting out some important future research questions in this area.

2.1. Context

In the discussion several aspects of the performance regime were highlighted. Also from the plenary papers (Seftel & Rikhotso, 2013) it became clear that the contexts vary widely and that variation can have strong impacts on the ability to implement a successful performance regime, independent of the regime itself.

In the discussion, four key factors came forward. First of all, the level of development of the market is essential. When the absence of competition does not allow for the ultimate incentive, being replaced by another operator, performance regimes are less effective.

The variation on this was high for the cases discussed in the workshop, from 10 possible competitors in Helsinki, 5 in Wellington, 8 in Santiago, 4 in Utrecht, 2 in Lyon and only one operator in Boston. In Australia and New Zealand negotiation and tendering are combined, with the possibility to switch between both approaches, allowing for long-term incentivizing of operators that perform well, with the threat of tendering being a useful discipline on operator performance. Pure negotiation with an existing set of operators as in Santiago allows for some form of performance management by shifting market share between them, but this seems to be less effective. In case of the integrated single operator of Boston, competition and choosing a potentially better performing operator is not an option to incentivize the operator. Here the performance regime only exists to stimulate the existing operator into better services and efficiency.

The way in which the operators are chosen (when there in no free market entry), also plays an important role in securing quality. Competitive tendering in Europe for example does not allow for the use of past performance in the choice, as it could hinder market entry of operators with no prior performance in the tendered area. Using past performance in awarding concessions could provide a strong quality incentive, like it does in some other examples in the workshop (e.g. Australia and New Zealand).

In the cases discussed, there was a variety of choices made in terms of demand risk: putting it entirely with the operator, authority or some form a shared demand risk by limiting the downside and up-side risk to the operator, giving a bonus for patronage growth, or fare-box revenue sharing. The discussion showed that putting demand risk with the operator is a robust way of incentivizing for performance in terms of quality of services. Obviously, this has to be combined with some level of freedom of the operator on the tactical level. A key issue though is whether some aspects of demand risk are outside the control of operators (such as the state of the economy). In rail in Britain, for example, there has been considerable debate about how to insulate rail franchisees from exogenous demand risk – that is, relating to the growth in GDP or employment in the economy.

These aspects of the context set the stage for the effectiveness of a performance regime. The remainder of the discussion on performance regimes was focused on improving performance once an operator is chosen and contracted.

2.2. Degree of maturity

As well as differences in context, the cases discussed showed different levels of maturity of the performance regime. In the

discussion three key aspects of maturity emerged. First, history will affect the degree of maturity of the regime. For example, how experienced are the operators? Where operators have been running services for many years they will have a good degree of understanding of demand and supply conditions. They will also potentially have considerable power and there is a danger that they could "capture" the authority to the detriment of passengers.

Second, a performance regime needs a sound institutional basis. Clearly, a good contract is part of that, with a well described system of KPIs and related incentives. This has been the major focus of earlier Thredbo discussions on performance regimes (see for example Nelson & Merkert, 2013). However, contracts are only as strong as the institutional environment in which they are functioning. Consequently, a performance regime is also dependent on the institutional maturity of a country, mostly of its legal system. Adequate resourcing, with staff that are capable of managing complex contracts (from an economic, operational and legal perspective) is also key, as is continuity of experience within the authority over time.

Related to this, the staff of the authority have to act on the data and ensure that the incentive mechanism in the contract is enforced. The discussion in the workshop showed that a mechanistic approach to invoking penalties or awarding bonuses (enforcing) is not always the most productive use of the performance regime. A mature KPI and incentive system needs to be followed up by strong negotiations from the authority staff with the operator. The staff of the authority needs understanding of the difference between situations where it is appropriate to directly impose penalties and award bonuses (enforce) and when to see them as a starting point for further discussions (improvement).

Finally, KPIs should be defined in a way that technology is available to objectively and reliably harvest the data, and communicate that data to the authority in a trustworthy way. When contract-level KPIs are set that do not take into account the operational level of data harvesting and communication and the quality of that data available, the KPIs do not reach their potential in the performance regime. Also the technology itself has to be mature.

A mature system needs all three of the above ingredients. The maturity of the system will affect the ability of the authority to produce sensible and sophisticated KPIs that are not easily gameable. In the contract, the KPIs are described and operationalized. Clearly, they should be objective, robust, and with limited possibilities to be gamed. Examples from the Netherlands rail showed how KPIs of punctuality incentivized the operator to leave the station early, only to stop at the next block with a red signal. Passengers could have made that connection if the train had waited the extra minutes at the platform, with no penalty to the overall travel time. The KPI was not robust in improving quality of service. The operator gamed the KPI, to the detriment of the service.

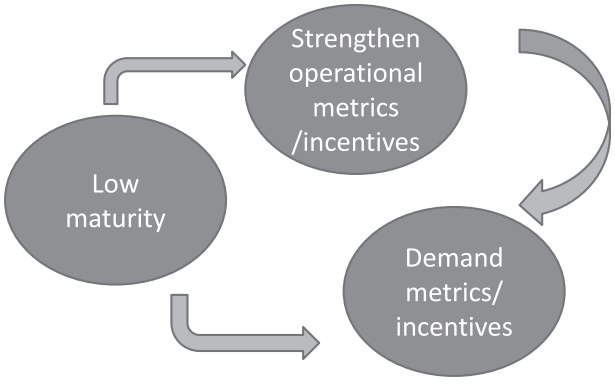

Fig. 1. The cycle of maturity.

The above discussion has an impact on the type of performance regime that will be appropriate in different contexts. In situations of low maturity performance metrics that are linked to demand and the passenger are likely to be optimal, given the difficulties in less mature regimes of specifying and enforcing a sophisticated performance regime based on operational measures. More mature environments would then look to implement a regime based on such operational measures, but in the longer term it will be desirable to harness natural incentives, based on demand, alongside operational measures (thus completing the cycle of maturity – see Fig. 1).

2.3. Interaction between operator and authority

The workshop discussed the role of KPIs in the interaction between authority and operator. First of all, the use of the term KPI was contested. The essence of indicators of operators' performance is not that they show key performance, but that they show those performance indicators on which compliance is needed. For example, patronage generally is a key performance aspect. However, in the case of net cost contracts, an additional system of KPIs penalties and bonuses may not be necessary. When the authority's main goal is to incentivize patronage, the net cost contract (possibly with suppletion of fare box revenues) could provide enough of an incentive. However, when compliance is needed with more and other factors, other KPI's have to be added.

In the discussion a number of dilemmas became apparent that are relevant for the way in which KPIs are defined and used. The first dilemma is that between *service* related and *task* related KPIs. Service related KPIs (like customer satisfaction) focus the operator more on integrated service quality; however, they are harder to objectively measure and less actionable to the operator than task related KPIs (like buses on time).

A second dilemma is between *improvement* and *punishment*. Is the performance regime put in place to improve services, or to punish the operator in case of underperformance? For example, a major penalty could reduce innovation potential at the operator level or even lead to bankruptcy. This eventually has negative effects on service quality. On the other hand, if penalties are never administered after failing to meet KPI standards, the credibility of the performance regime is at stake.

A third dilemma is between *partnership* and "*whack-a-mole*". In a trusted partnership, the authority is generally codeciding and as such is also partly responsible for missing KPI targets. The role as independent judge in administrating penalties is compromised. Staying independent, not getting involved, and just administering bonuses and penalties, denies the fact that authorities control many key ingredients of service quality delivery. The last dilemma not only focuses on the relation between authority and operator, but also between operators. KPIs can incentivize the operators to *cooperate* to offer quality or to *optimize* on their own performance, which are not necessarily the same.

A performance regime can be set up to provide the authority a great deal of power over the operator. That power has to be used carefully, as inappropriate use can stifle the possibilities of the operator to provide attractive services. With failure by the operator to reach set targets comes the inclination of the authority to increase penalties and strengthen interventions. On the other hand, there are many different areas in which governments are active that influence the possibilities of the operator of these services. The obvious areas are infrastructure development and urban planning. However, many others are relevant for the success of the operator, from fuel tax, working conditions regulation, to school times, parking policies, etc. Striking the right balance between building a trusted partnership on the one hand and enforcement by

transparently acting on (un)realized KPI thresholds on the other is the broader and key dilemma of a performance regime. Transparently acting on (un)realized KPIs should include understanding of what the data is saying. The data has to be translated into meaningful information and knowledge about the situation to effectively improve the performance. In the workshop we saw examples of this in the field of punctuality.

2.4. An analytical framework for an effective performance regime

The workshop gathered a number of robust lessons for the development and operation of a performance regime. First of all, KPIs have to be distinguished between aspirations and targets. Aspirational KPIs can be related to patronage and system wide quality. Incentives can be natural, simply by putting demand risk with the operator. Target KPIs have to be realistic and based on historic data, preferably from the region in which services are provided. The incentives also have to be realistic and related to the marginal costs, market price and societal gains of the attainment of the KPIs thresholds. As noted below, new research on understanding the marginal costs and benefits of improvements in performance is a key area for future research.

Incentives and KPIs work on three levels (see Fig. 2). First, some goals can be secured in the contract award, with incentives to the operator to promise (and consequently realize) goal attainment on specific KPIs. The incentive is the awarding of the contract itself. An example is the environmental performance of vehicles, which operators include in their bid to get the contract.

Second, additional goals can be secured in the contract as natural incentives. The clearest example is the use of net cost contracts in which demand risk is placed on the operator. Further, to some extent operators have natural inclination to have safe operations (as this will affect their insurance premia). These natural incentives can be used in the performance regime, even without explicit KPIs and incentives.

Finally, other public values might not align with those of the operator, thus requiring these to be robustly measured and incorporated into the core of the performance regime. For example, the cost structure of peak hour services could incentivize the operator to not raise service levels enough in the peak. Consequently, peak hour seat availability could be included in the performance regime, including KPIs and incentives.

Clearly, the KPIs and incentives need sound monitoring and monetizing: how is the operator performance vis-à-vis a set threshold and what are the financial consequences of this performance? In deciding on where to secure a value, a key question should be the ability to use natural incentives and to monitor and monetize the KPIs to align the operator with the government goals.

Another consideration for authorities is to understand the interactions between various goals and KPIs. Often different goals and their related KPIs are considered separately. The operator though will be confronted with possible dependencies between KPIs. For example, the authority could incentivize operational punctuality or operational speed. The operator can increase punctuality by putting additional slack in the schedule. Obviously, this reduces operational speed. The authority should understand these dependencies and form an idea of how it values conflicting KPIs in the design of the performance regime. Additionally, the incentive for the lowest price in the contract award will have a consequence on quality. The authority needs to understand that trade-off and be clear about priorities. Interactions obviously become more complex with more KPIs. In the workshop examples were given from 5 (New Zealand) to 40 KPIs (Ireland).

A further issue is the way in which the goal is translated into a KPI. If several ways are possible to formulate the KPI it is advisable to take a passenger perspective. The key question to be answered is: what KPI could help the passenger most? A predictable service could be formulated as following a fixed schedule with the KPI being the percentage of the departures on time (traditional punctuality). However, in situations with high frequencies, the passenger is much better served with regularity than with punctuality. In that case the KPI would better secure compliance to a set headway, with buses every *x* minutes, rather then compliance to a set schedule, with the delayed bus being followed shortly by a nearly empty bus.

Finally, as noted earlier, as well as incentives provided by the performance regime, natural incentives through, for example,

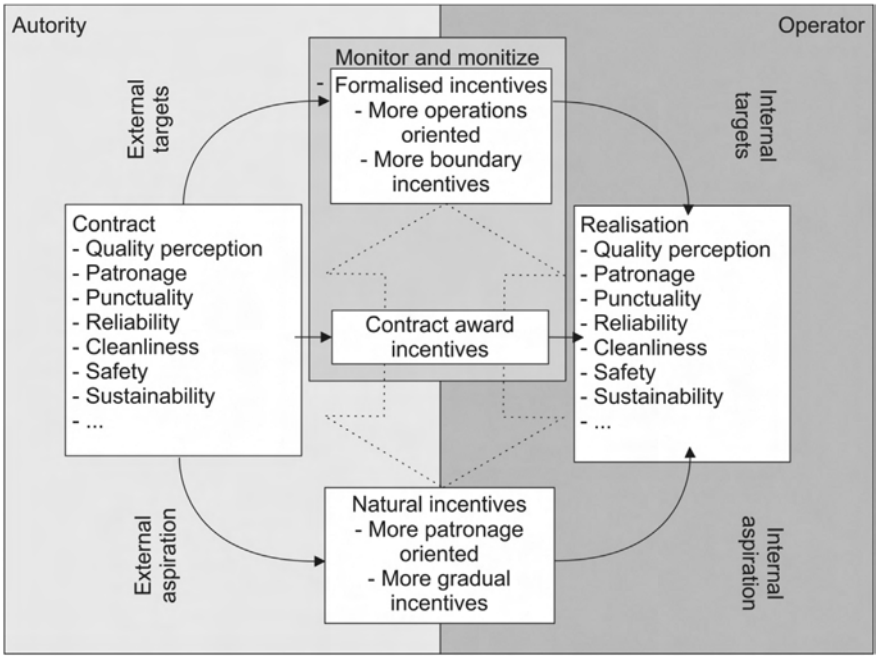

Fig. 2. The interaction between authority and operator on three levels of a performance regime.

exposing operators to demand risk, the discussion in the workshop emphasized the importance of performance being linked to re-award of the contract. This mechanism was deemed not to play a significant enough a role at present, though clearly this varied across different countries as noted above. Another important factor is the extent to which benchmarking can be used to compare the performance of operators. It was noted that yardstick competition, as used by economic regulators, could be a powerful tool, but that developing a credible regime using appropriate techniques and dealing with heterogeneity between operators is a major challenge.

3. Future questions

The workshop has developed several key research questions. A performance regime needs to strike the right balance between enforcing and improving. From the discussions it became clear that both extremes seem rather unproductive. Also it became clear that the right balance is dependent on maturity of the institutional environment and the contract type. However, where the right balance is, would be an excellent question for further research. The same question applies to the number of KPIs and the balance between system related KPIs (aimed at overall system performance) and task related KPIs (aimed at task execution).

A second important area highlighted for future research concerns valuation. What is the marginal cost and indeed benefit of improving reliability for example? The discussion on punctuality triggered further questions on how specific values can best be operationalized into KPIs, in a given context. For high frequency services moving away from schedule compliance to headway compliance makes a great deal of sense. Also, for other KPI's their formulation is context dependent. More understanding of that context dependency is needed.

The workshop discussed the need for further research on methodologies for benchmarking performance between operators. In particular it was noted that statistical and or data envelopment analysis (DEA) approaches could be utilized as a comparator method to normalized unit cost approaches. Such statistical methods are widely used by economic regulators in the utility sector, for example.

Finally, performance regimes have long been seen as a set combination of KPIs and incentives. However, a wider range of factors comes into play when evaluating the effectiveness of a performance regime. A shift is needed in the research from understanding the performance regime under assumptions of operator and authority behavior to understanding the performance regime, including real-life behavior of operator and authority. Related to this point is the question as to how behavior is linked to ownership – how do private operators differ from state owned ones or intermediate non-profit bodies such as Network Rail in Britain?

Papers presented in the workshop

The looming crisis in French public transit **Dominique Bouf** and **Bruno Faivre D'Arcier** LET – University of Lyon, France

Measuring the performance of urban public transport in relation to public policy objectives **Bruno Faivre D'Arcier** LET – University of Lyon, France

Incentive schemes, provision of quality and monitoring: the case of the public transit system in Santiago de Chile **Patricia Galilea** and **Marco Batarce** Pontificia Universidad Católica de Chile

Incentives in bus concession contracts: the Latin American experience **Andres Gomez-Lobo** University of Chile and **Julio Briones** Pontificia Universidad Católica de Chile

Implementing New Zealand's new public transport operating model: a description of the challenges and progress to date **Rhona Hewitt** Greater Wellington Regional Council, New Zealand **Rachel Drew** NZ Bus limited, New Zealand

Can regulatory policies improve the performance of a bus system? A statistical analysis for the case of Transantiago **Carlos Melo** Industrial Engineering School, Diego Portales University, Chile

Measuring and improving the efficiency and effectiveness of bus public transport systems **Georgios Georgiadis, Ioannis Politis** and **Panagiotis Papaioannou** Department of Civil Engineering, Aristotle University of Thessaloniki, Greece

Incorporating service reliability in public transport design and performance requirements: international survey results and recommendations **Niels van Oort** Department of Transport and Planning, Delft University of Technology, The Netherlands and Goudappel Coffeng Mobility Consultants, The Hague, The Netherlands

Efficient frontier analysis of Dutch public transport tendering: a first analysis **Wijnand Veeneman, Janneke Wilshut, Thijs Urlings** and **Jos Blank** Faculty of Technology, Policy and Management, Delft University of Technology, The Netherlands **Didier van de Velde** Faculty of Technology, Policy and Management, Delft University of Technology, The Netherlands and inno-V, The Netherlands

An automated data driven performance regime for operations management, planning, and control **Dominick Tribone** Massachusetts Bay Transportation Authority, Boston, MA, USA **David Block-Schachter, John Attanucci** and **Nigel H.M. Wilson** Department of Civil and Environmental Engineering, Massachusetts Institute of Technology, USA

Safety as a key performance indicator: creating a safety culture for enhanced passenger safety and comfort **Anders Wretstrand**, **Bengt Holmberg** and **Monica Berntman** Department of Technology and Society, Lund University, Sweden

Incentive schemes for bus drivers: the case of the public transit system in Santiago de Chile **Ignacio Tiznado, Patricia Galiliea, Felipe Delgado and Markus Niehaus**, Department of Transport Engineering and Logistics, Pontificia Universidad Católica de Chile, Chile

Additional literature

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Seftel, L., & Rikhotso, N. (2013). Pains and gains of a negotiated contract: the Johannesburg Rea Vaya BRT experience. In *Conference on Competition and Ownership in Land Passenger Transport*. Oxford.

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Workshop 2 Report: Bus Rapid Transit

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SUMMARY

Workshop 2 examined critical success factors, operational enhancements, appropriate contractual and institutional settings and complementary policies of BRT systems, building off the discussion started two years before in Durban. Even though implementing a BRT corridor is almost always very challenging, the evidence shows that the BRT industry is quite lively and growing steadily in kilometres and daily ridership in all continents. The Workshop identified six cyclical stages for BRT implementation: policy, frameworks, strategy and planning for implementation of BRT, stakeholder outreach and process management, deployment and operationalization of BRT, and post-deployment assessment. The papers and discussion provided key examples and results in all of the six stages leading to eight key messages. These main points ranged from an optimism that BRT is spreading, but that BRT is not itself the objective; the need for innovation in not just operations, but regulatory, institutional, and participatory frameworks, which requires increased public and private capacities; and recognition of the differences between cities, particularly in the developing and developed world. The workshop identified policy recommendations and suggested some specific research topics for Thredbo 14.

1. Thematic overview

1.1. Introduction and scene setting

This paper reports on Workshop 2 of the 13th Thredbo Conference, held in Oxford during 16–20th September 2013. The workshop was dedicated to issues related to Bus Rapid Transit. The workshop consisted of presentations based on a set of pre-submitted papers (see reference section below), followed by discussions both about the individual papers and of broader issues arising. In total, 14 papers were submitted and presented to the workshop, along with one unscheduled presentation. A further two papers from the Plenary sessions have been included in the discussion and analysis. There were 25 participants in the workshop.

The pre-workshop description was as follows:

> "This workshop will provide an update on BRT systems around the world and considerations of related concepts such as Corridor Dedicated Transit. It will examine critical success factors, operational enhancements, appropriate contractual and institutional settings and complementary policies. It will also consider BRT as an agent of transformation of urban transportation, both of the services and of the transport operators, and the way BRT may evolve from existing operations. It will consider the adaptation of institutional and regulatory frameworks for BRT; or in many cases in developing countries where no adequate framework exists, establishment of a permanent or interim framework sufficient for BRT. Business models for BRT, including system financing, contractual arrangements, use of PPP, and allocation of risk, will be discussed. The impacts on and interaction with pre-existing transit operators, including paratransit, will be examined. Consideration will also be made of the users of BRT systems and how they may be better involved in system design."

1.2. Key findings from the Thredbo 12 Workshop on BRT

The Thredbo 12 Conference (Durban, 2011) was the first to have a workshop dedicated to BRT. Consequently, a significant part of the workshop dealt with 'what is BRT and what can it achieve?' as with 'what are the institutional, regulation, ownership and competition aspects of BRT?", how is it organised? Many of the papers and the discussion at that workshop dealt at least as much with transportation policy and with the design and operational dimensions of BRT as they did with the core Thredbo themes. Nevertheless, this

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was important for the Thredbo community to appreciate that BRT is significantly more than in improved bus services, both in its transportation characteristics and its organisational aspects.

This dual approach was reflected in the workshop findings, which were extensive. Some key findings are presented here for context and continuity:

- Cities urgently need mobility improvements, which must meet the need for door-to-door connectivity. BRT must be conceived as part of a multimodal mobility system.
- To effectively address mobility challenges using BRT, it is essential to understand the transportation needs and the policy objectives for BRT implementation.
- All dimensions should be considered – institutional, financial, operational, etc.
- Successful examples are vital as inspiration, but they need to be customized to the host environment rather than simply imitated.
- Context matters, implying constraints and opportunities to the process.
  •Desirable ingredients for success include the existence of national transit policy and guidelines, political leadership and support, a sufficient institutional framework and stakeholder buy-in.
- BRT transition and implementation may be difficult as many actors are involved.
- BRT has often been expected to solve many problems beyond the transportation task.
- The BRT concept is flexible and can be adapted to a wide variety of contexts.
  - Capacity can reach over 45,000 passengers per hour per direction (pphpd) by using passing lanes and large stations, although this is exceptional.
- Stations and intersections need to be properly engineered to increase capacity.
- Express services are crucial to improve capacity where high throughput is required. They also improve quality of the travel experience and reduce costs.
- Headway control is crucial in the performance in terms of waiting time, travel time, reliability and comfort. Weak control can require additional buses and resulting higher operating costs.
- Capital investment requirements for BRT are significantly lower than rail-based modes. They can also be phased and could be less vulnerable to funding issues than 'all or nothing' systems such as LRT.
- BRT is leaving its pioneering phase and needs some more formalization within both institutions and policies.

1.3. Core themes of the current Workshop

The findings and research recommendations of Thredbo 12 in 2011 were reviewed and deemed to still be relevant to the Workshop. It was noted that all of the core themes of Thredbo – competition, ownership, regulation, contracting, institutions and relationships – intersect around BRT. Indeed, especially in developing and emerging countries, BRT is often a stimulus of change in these domains. Thus, BRT needs to be viewed as more than a transportation mode, and as a powerful agent of transformation for urban transportation.

On that basis, a two-way overarching theme was proposed:

- What can BRT take from the Thredbo experience?
- What can BRT give to the Thredbo community?

1.4. Key reference materials on BRT

This paper does not deal with the design or operational aspects of BRT, except where they are relevant to the workshop strands. The interested reader is directed to the following resources, as examples of the growing sources of available information:

- BRT Centre of Excellence at www.brt.cl
- EMBARQ at www.embarq.org
- ITDP at www.itdp.org
- National BRT Institute at www.nbrti.org
- Buses with a high level of service (BHLS) at www.uitp-bhls.eu

2. Integration of the key themes of the presented papers

The workshop papers describe different phases of the lifecycle of BRT deployment:

- Policy development
- Frameworks
- Strategy and planning for implementation of BRT
- Stakeholders, outreach and process management
- Deployment and operationalization of BRT
- Post-deployment assessment

These phases are sequential, but they are also cyclical. In particular, post-deployment assessment provides essential feedback to policy-making, investment decisions, systems design, operational methods and stakeholder management strategies (Fig. 1).

The relevant issues emerging from the papers and presentations are presented in this section for each of the six strands. The broader issues and findings are then presented in the subsequent sections.

2.1. Policy

- Browning argues that individual modes (such as paratransit) should be upgraded while work is being done to implement integrated systems. This allows for service improvements while long-term projects are being carried out.
- Dantas demonstrates with the case of Brazil that policy and decision-making between modes can be influenced by investors, in particular new entrants from outside the transport sector are pushing PPP for rail projects and existing bus

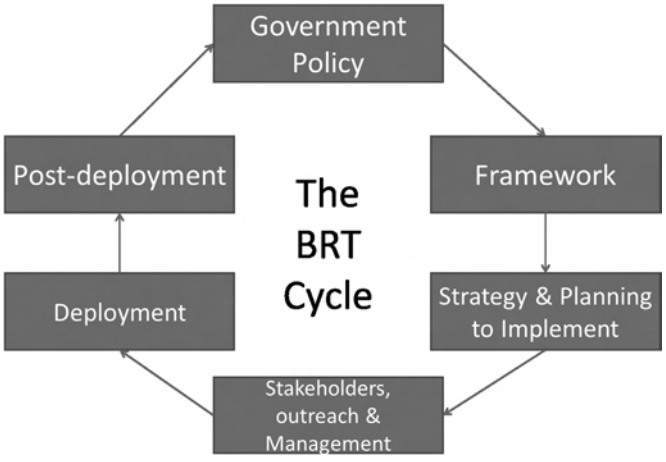

Fig. 1. The lifecycle of BRT deployment.

operators lack the sophistication to presenting competing projects like BRT.
- Filipe and Macário propose a methodology to evaluate policy packaging for the implementation and management of BRT, with the goal of identifying the relationship between system performance and the policies and institutional design of the project.

2.2. Frameworks

- Gyamera, Konadu, and Finn present the process of implementing a new regulatory framework in two urban areas in Ghana. It was based on 5 pillars, but even the minimum level of creating the legal basis, setting up regulators, and establishing permits for all routes posed a challenge.
- Brader and Finn examine the institutional and organizational capacity challenges of the design and implementation of BRT in the Philippines. New frameworks will have to be developed as there is no tradition of urban transport agencies or exclusive operators. A key concern is how to include the existing jeepney operators.
- Finn outlines different cases where BRT has made significant changes to the existing institutional, regulatory, financing or participatory frameworks. In addition to operational advancements, BRT can require or push innovation in existing regulatory and institutional frameworks.
- Rizvi and Sclar emphasized that process matters. It is not just what is implemented, but also how BRT is implemented that influences outcomes. The planning process is three dimensional; it must consider approach (strategy) and timing in addition to the series of steps to be performed.
- Kaenzig explained that there are currently no urban passenger transport agencies in the cities of the Philippines, nor is there a tradition of exclusive (i.e. single operator) permits/franchises for routes. Whilst route franchises are issued to existing jeepney and bus operators by the Land Transport Franchise Regulatory Board (LTFRB), an agency of the national Department of Transport and Communications (DOTC), this only gives permission to operate and does not define service standards or hours/days of operation. This presents challenges to the franchising and regulation of BRT operations.
- Hidalgo discussed the cases of Cali and Bogotá, highlighting the importance of political leadership, adequate technical planning and funding for the implementation of integrated systems, inclusive of BRT. The two cities have benefited from strong leaders, capable planning teams and financial support from a National Programs. They have created dedicated institutions (special purpose vehicles) to manage implementation and control operation, and have relied on the private sector for bus services. Giving financial constraints, productivity has been prioritized over service quality, resulting in high occupancy and user complaints.

2.3. Strategy and planning for implementation of BRT

- Rizvi and Sclar suggest that the BRT planning process (i.e. how a project is planned and implemented) is an important determinant of project success.

It impacts, and is in turn impacted upon by design, institutional and political conditions to influence outcomes – as well as having its own direct influence on project outcomes. Understanding the importance of planning process to BRT success is a first step. More work is required to understand which strategies to BRT planning work best in which contexts. This knowledge has the potential to vastly improve BRT success.

- Gyamera et al. discussed the first step of the transition from informal, self-regulated transit in Ghana which was to develop bus corridors to demonstrate the viability of formal operations. BRT is seen as a later step, but permits are being established to prepare for larger vehicle service on important corridors.
- Hidalgo suggests that corridor-by-corridor BRT implementation has limited impacts in developing cities with disorganized and unregulated public transport services. There is a need to reform the citywide public transport provision, following Transantiago, but taking care of the issues observed there. In the cases of Cali and Bogotá in Colombia, implementation of the integrated systems has been protracted, due to policy discontinuities – resulting from changes in local leadership – and opposition of affected stakeholders – mainly traditional private public transport providers. The integrated systems in the two cities, however, are showing overall positive impacts, but underscore the need for shorter time frames, to meet user expectations and reduce overall implementation costs – for the city and the private operators.

2.4. Stakeholders, outreach and process management

- Rizvi and Sclar describe the outreach and education campaign that the promoters of BRT undertook in Ahmedabad, India. This included soliciting feedback from the public, working with the media, reaching out to different community leaders, and having a three month free trial period for riders to test and understand how to use the system.
- Ka'bange, Mfinanga, and Hema discussed the need for formal public transit in Dar es Salaam, Tanzania and how plans for a rapid transit system were opposed by some city residents. The reason was due to the lack of a legal and regulatory framework for land use planning and property compensation and resettlement. An inclusive process for stakeholders and dissemination of information are needed in addition to fair compensation for land.
- Gyamera et al. explains the successful process used to move paratransit operators into a regulatory framework in Ghana as a step toward BRT.
- Dantas explores the entry of new investors in urban transportation projects in Brazil. Corporate interests from outside the transport sector are investing in (and advocating for) new PPP projects, but primarily in rail. In most cases, there are institutional barriers between the existing bus operators and the government and new entrants. BRT is limited in part because the existing operators do not have the experience of designing infrastructure and technological based service and advocating for funding.
- Browning suggests that individual vehicle owners of existing paratransit should be assisted to form cooperative semi-formal companies with a special fund to help meet the costs of the transition and a starter service using the existing vehicles.
- Brader and Finn explain how the organizational structure of the existing paratransit service in the Philippines limits their ability to formalize or form ownership units to participate in BRT service. At the same time in cities with a traditional of informal transit, a deep understanding of the relationship between travellers and the existing mode is necessary.
- Kaenzig explained that the development of BRT in Cebu was characterised by a continual programme of consultation that has raised awareness and support. A level of expectation and

excitement was developed, and this momentum must be maintained. To a certain extent there is pressure from users on politicians to deliver something that they themselves have identified as much needed designed to achieve partial de-politicisation of the proposal.
- Seftel and Rikhotso argue that although there have significant pains in the way the negotiated contract has been constructed for the Rea Vaya system in Johannesburg, the gains are still considerable. If forfeited, it would take them away from the critical transformation objective of the Rea Vaya BRT. They consider that the answer does not lie in moving away from a negotiated contract but rather in continuing to develop their approach to a negotiated contract, the terms of such a contract and the enabling environment within which the contract is negotiated.

2.5. Deployment and operationalization of BRT

- Lindau, Hidalgo, and de Almeida Lobo (plenary session paper) review implementation of BRT in multiple developing city contexts and indicate that it faces several problems associated with institutional and financial frameworks. They indicate that systems face complex planning environments (multiple agencies, multiple jurisdictions and different levels of government); lack of alignment among stakeholders; perception of BRT as a lower quality mode; traditional bias towards road capacity expansions; and lack of community participation. BRT also faces implementation barriers, including optimism bias; discontinuities due to political cycles; lack of national policies supporting BRT development; insufficient funding for adequate implementation; and, very often, rushed inauguration of incomplete systems. Recognizing these issues and barriers is valuable for advancing deployment.
- Rizvi and Sclar explains how Ahmedabad, India used a strategy of connecting busy places but avoiding busy roads in order to avoid conflicts over road space experienced in Delhi. They also focused on building a network and not just a corridor and made pragmatic decisions to change the route and design when facing conflicts. Learning from the problems in Delhi they also focused on enforcement and training of staff. Globally, certain techniques or approaches to BRT deployment and operationalization have not only built public and political support, but have also improved design by integrating feedback processes, without over-burdening existing institutional capacities. There is an unrealized opportunity to build on these experiences and apply to other contexts. What is needed is more systematic attention to issues of planning and implementation (i.e. how, not just what).
- Clifton, Mulley, and Hensher examine a series of proposals for rail service to a residential area of Sydney to see whether, as the proposed project changed over time, the benefits for transit users improved. In particular if the rail project now under construction provides better frequency, travel times and fares compared to the existing express bus service. The results found that some users fared better with rail service and some better with the existing bus service or other proposals.
- Kaenzig discussed that building of the BRT will involve Right of Way acquisition, although this is mainly restricted to station, depot and terminal areas. The potential positive impact on land values presents potential opportunities of working with developers to in land procurement and construction. The Jeepney sector will be impacted, and some operators will be displaced. Due to their fragmentation and low level of organisational capacity, the operators of the BRT services will not emerge from the Jeepney sector. Rather, the Jeepneys will continue to play the role of citywide public transport, and some will provide feeder services to the BRT.

2.6. Post-deployment assessment

- Currie and Delbosc reviewed the performance of Australasia BRT systems from 2006 to 2013. The systems range from busways to on-street service but both generate good ridership; segregated lanes do improve speed, reliability and attract the highest ridership per km. Frequency has a strong influence on boardings per vehicle km.
- Browning argues that there should be mid-term reviews of long-term action plans; these reviews would consider the proposals in the long-term plans as interim stages.
- Hensher, Li, and Mulley used random effects regression with data from 121 BRT systems to model variables impacting BRT ridership. Significant variables included fare, frequency, station spacing, pre-board fare collection, and location of doors. Another model also identified that higher frequencies exist on corridors with high density, more trunk lines, and bus priority infrastructure.
- Munoz & Batarce (a) reviewed Transantiago five years after its launch. Despite initial problems the new system has integrated and formalized transit service reducing externalities significantly. While it still faces challenges like reliability of bus service, low bus speeds due to lack of dedicated infrastructure, fare evasion and poor public perception, Santiago's experience has provided valuable lessons to other cities.
- Munoz & Batarce (b) developed a methodology to compare levels of service in multiple cities that provides a comparison even when different data is available in each city. They use a representative sample of trips in each city and define level of service with a range of variables including speed, frequency, travel time and waiting time.
- Rizvi and Sclar pointed out that post deployment assessment needs to extend beyond traditional evaluation of design (technical and financial), political and institutional issues, and also consider 'how' the project was implemented – i.e. the planning process – timing (duration and moment of action), strategy and tactics employed, and steps undertaken (content and sequencing).

3. Workshop discussion

Arising from the paper presentations and discussions, a set of findings or 'take-aways' emerged. This consisted of seven findings identified by the group, plus a further finding that became evident from the discussions themselves.

1) Despite the challenges faced in all locations, BRT can be implemented and is increasingly widespread.
2) What is needed to achieve success, when success is not at all guaranteed?
3) The BRT itself is not the objective, but it is often necessary to clarify what is.
4) Institutions, regulations, contracts, public participation and political leadership must be aligned, some of which require novel solutions in the host environment.
5) It is necessary to win the hearts of citizens.
6) Key capabilities must be developed.
7) If you succeed, the rewards for the city are very significant.
8) There are significant differences between BRT in the developed and developing world (*or 'mature and emerging systems'*), in particular in terms of frameworks and goals.

These items are developed in the following sub-sections.

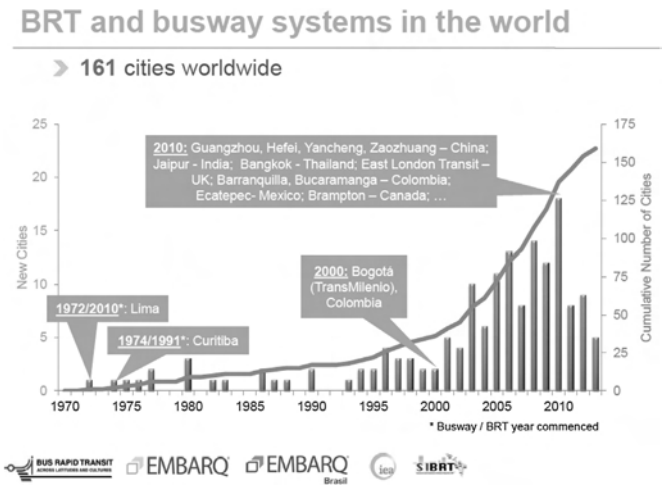

Fig. 2. Number of BRT systems opened by year (1970–2013).

3.1. Despite the challenges faced in all locations, BRT can be done and is increasingly widespread

The number of BRT systems has increased steadily since the mid-1990's, with an average of about 10 new systems opening each year over the past decade (see Fig. 2).

As of November 2013, the Global BRT Database (www.brtdata.org) includes 168 cities with 324 corridors and 4489 km of BRT and bus corridors. These systems serve more than 30.8 million passengers every day. The highest concentration is still in Latin America (56 cities, 19.5 million passengers per day), with Asian countries catching up fast (35 cities, 8.1 million passengers per day). Bus priority has a long tradition in Europe, with 43 cities (1.7 million passengers per day) USA and Canada, with 24 cities (890,000 passengers per day) and Oceania, with 7 cities (330,000 passengers per day). New systems are being implemented in Africa and the Middle East.

BRT has become an alternative mass transit mode in multiple cities and part of multimodal networks, but is still a recent phenomenon: 131 cities (78%of the tally) implemented systems since 2001.

BRT is implemented within a very wide range of institutional arrangements. In some cases, BRT is implemented within existing frameworks. In developing countries, it is often the case that the implementation framework and operator structure is developed as part of the BRT deployment (Finn, Brader, Gyamera, Olyslagers).

3.2. What is needed to achieve success, when success is not at all guaranteed?

The workshop suggested that BRT required the existence of national transit policy and guidelines, political leadership and support, a sufficient institutional framework and stakeholder buy-in. Two new items were added to this list: planning (Rivzi) and integration (Hidalgo, Batarce…). Still the participants recognized the difficulties and suggested some strategies for overcoming them: adequate involvement of stakeholders, better outreach and clear communications (Hidalgo).

It is essential to have a better understanding of successful approaches to planning and implementing BRT systems. BRT is not just a matter of technical design and project management. It is a major policy, institutional and political issue, and this is especially true in developing countries. To be successful, it is necessary to understand these dimensions and whose interests are at stake, and to build strategies around these factors (Rizvi).

In developing countries, the channels and mode of dialogue with the industry sector are important factors. Even where these is a transport regulator, it does not have the same level of authority or enforceability as in developed countries (although it should be noted that labour unions in developed countries can delay projects just as effectively and intransigently as paratransit unions can in developing countries). In countries with strongly organised paratransit, the sector asserts itself strongly and will demand both a key role and significant concessions. This is evident in countries such as South Africa (Seftel, Browning), Chile (Munoz), Ghana (Gyamera) and Nigeria (Finn). In contrast, there are other countries where the paratransit sector is pervasive but fragmented, and in which there is no obvious mechanism for dialogue or reaching binding agreement with the sector. This is evident in countries such as Tanzania (Mfinanga) and the Philippines (Brader). Somewhat surprisingly, the latter are countries where there is a formal permit system for paratransit. This results in counter-intuitive outcomes where situations with strong and aggressive paratransit unions are ultimately amenable to agreement and active participation in the BRT (albeit at a high price and sometimes with loss of life), whereas situations with passive and fragmented paratransit can lead to protracted and fruitless efforts at engagement, and to impasse.

Compensation has become a core issue in BRT implementation in South Africa. This has resulted in a very high and unsustainable cost to implement BRT (Seftel, Browning). In most other countries, a different approach has been taken where the paratransit and informal sector stakeholders are assisted with direct participation in the BRT, as in Colombia (Hidalgo), Chile (Munoz), Ghana (Gyamera). Alternatively, there is support to transition to new routes or to different means of livelihood as in Bangladesh (Olyslagers) or Philippines (Brader, Finn).

BRT projects in developing countries inevitably have many “soft factors”. These are issues that range from the unpredictable to the highly sensitive. Unlike technical design issues, they are hard to quantify or control, and their outcome is uncertain. While it is essential to have a well-developed strategy and the commitment to implement it, it is equally essential to have a “review stage” to take stock of whether the strategy is working and whether adjustment is required. This has been evident in South Africa where initial expectations for BRT deployment and stakeholder participation have not been met (Browning).

Political support is important, but so too is realism, consistency of vision, and consistency of political direction. In South Africa, there has been genuine support for BRT, but the political positions have not been without problem. Commitments given by the national Minister that there would be no loss of jobs and no loss of earnings have undermined negotiations and led to serious escalation of the compensation costs of implementing BRT. The imperative to implement BRT to deliver the football World Cup in 2010 has not been sustained in financial support thereafter. Changes of national or state Ministers can lead to everything being off the table again (Browning, Cronje, Mahlangu). It is also necessary to be convinced that the BRT will work (Mahlangu).

In Brazil, which also implements many BRT projects for the 2014 football World Cup and the 2016 Olympic Games in Rio de Janeiro, there are similar practical challenges. In addition, the sudden availability of large amounts of finance and the imperative to deliver key infrastructure brings new players to the table whose primary goal is to gain the available contracts. This presents a new set of challenges, both to the transport authorities to obtain the needed system quality, and to the established transport providers to avoid being squeezed out (Dantas). A further

challenge in these exceptional situations is the strong promotion of transport solutions that would normally be immediately rejected. To quote one mayor in Brazil – "every day someone offers me a monorail".

From the policy perspective, the big challenge is whether BRT will be the chosen "tool" to win the battle. BRT requires and can achieve a high level of design, technology and financing. The transportation stakeholders need to (and can) raise their game, learn new things, develop capacity and deliver the product. However, having developed the plans and shown they can deliver in a cost-effective manner, Government can just move on and instead adopt different and more capital-intensive solutions, and ignore the BRT offer (Dantas).

Sometimes a rather coercive approach is effective. In Cali, the contract period was set at 25 years. Whether or not this was optimal or fair, it certainly sent a very clear signal to the operators to "be in or be out". It provided a very strong incentive to the operators to participate, and to form the necessary set of consortia from indigenous operators that would gain the contracts (Hidalgo).

The effectiveness of the "big bang" approach remains uncertain. It is clearly a high-risk strategy, whose outcome cannot be known until after the event. It has been reasonably successful in Cali (Hidalgo), very successful in Seoul (Finn), but seriously problematic in Santiago de Chile (Munoz, Hidalgo). In the case of Santiago de Chile, the failures were at least as much due to the determination to proceed when key elements were clearly not ready as to the concept itself. Nonetheless, having got it wrong, it has been extremely difficult to recover from the reputational and financial damage (Munoz, Hidalgo, Finn).

The problems experienced at Santiago de Chile have been well documented in previous Thredbo conferences. In the main, they have been addressed and the system elements which should have been in place at system launch are now in place. However, there are two issues which were not foreseen that are now firmly entrenched. First, the system was forecast to operate on a break-even basis, but the deficit is currently about 40% of total costs. This funding challenge is explained because the system is expected to cover not just operational costs, but also one third of new Metro lines investments, bus terminals and two thirds of the student fares. Second, there is a very high level of fare evasion, estimated at about 20% in bus trips.

Finally, it seems that if BRT is correctly designed and implemented, the rewards for the city are very significant. In Australia, BRT growth has performed well above the trend for public transport. There is significant momentum both in kilometers of BRT implemented and in ridership (Currie).

3.3. BRT itself is not the objective, but it is often necessary to clarify what is

Policy packaging is essential to effective BRT deployment. It is well recognised that BRT is more than just a transportation technology. In developing countries, it is often implemented as much as an agent of transformation as a transportation tool (Gyamera, Brader, Rizvi, Munoz, Finn). In developed countries, it is often implemented as part of integrated passenger transport programs, or to stimulate urban development within TOD programs (Currie, Filipe, Seftel).

A comprehensive structure for policy packaging centred on BRT is currently in development, which offers a valuable tool for urban policy-makers (Filipe). A methodology for identifying the driving factors for BRT is also currently in development (Hensher).

There is some opinion within the industry sector that while BRT is a very welcome development, the way in which authorities espouse it has diverted attention from what may be termed the "lower order" forms of passenger transport. This means that the investment and management attention is placed exclusively on the BRT, while the regular bus lines and paratransit (that collectively carry far more passengers) are ignored. This issue was also identified in Thredbo 12.

3.4. Institutions, regulations, contracts, public participation and political leadership must be aligned, some of which require novel solutions in the host environment

Ahmedabad has been singularly successful in aligning political, institutional, operational and public opinion aspects towards the BRT system. This can be attributed (at least in part) to a shrewd management of the project development. It is postulated that the key has been to go beyond the traditional 'linear' or 'sequential' planning approach, and to instead handle in parallel three dimensions: (1) the traditional steps of project planning ("what to do"); (2) careful attention to timing and sequencing ("when to do"); and (3) good strategy and tactics, that give great care to stakeholders and sentiment ("how to go about it"). The outcome has been not only successful implementation, but also that classes of people in India that would not normally interact can agree on and use the BRT together (Rizvi, Finn).

Also in Ahmedabad, there has been a strong institutional aligning. The city administration is well aligned institutionally and politically with Gujarat State. Janmarg BRT is established as an SPV owned by the city. Its Board is essentially the core members of the Transport Committee that organises all other public transport in the city, which can be very fractious and politically motivated. However, when the members meet as the Board of Janmarg they are compelled to focus on the interests of the BRT, and they have been very effective (Finn, Rizvi).

The institutional frameworks may also change after the implementation of BRT. This is especially visible in Australia, where all systems have been implemented in frameworks with some form of direct government control, but in all cities except Brisbane the framework has subsequently shifted to private sector orientation (Currie). The converse also holds. In Australia, there is a clear imperative to invest in transport, but the political advantage is in modes that have high expenditure and receive high media profile (Clifton, Currie).

In the Philippines, the institutional and regulatory frameworks have needed realignment to support the implementation of BRT. At one level, it has been necessary to provide a role for the city in the organisation of public transport where until now it is exclusively a national ministry function. At another level, the regulatory framework is being adjusted to allow for exclusive route licences where previously only a franchise system was provided for. Since there is a single framework for all surface public transport in Philippines, this requires a careful design to avoid unintended consequences (Brader, Finn).

In Ghana, there has been a complete re-regulation of the public passenger transport in the two main cities of Accra and Kumasi. This has been instigated by the BRT project. The paratransit sector has accepted to move from a self-regulating situation to one where the cities are the regulatory authority, and to accept a new route licencing regime. Within this framework, both the BRT and higher-quality bus services can be implemented, and also a general uplifting of the paratransit sector can be achieved (Gyamera).

In Tanzania, DART Agency is a dedicated agency established to implement BRT in Dar es Salaam. It has been given specific authority to plan, deliver and manage a network of BRT corridors in

the city. While the national surface transport agency SUMATRA remains as the regulator of services and fares, DART Agency implements the BRT (Mfinanga).

There is value in developing a more systematic understanding of how different contexts have dictated different approaches to these issues and how these decisions have impacted outcomes (Rizvi).

3.5. It is necessary to win the hearts of citizens

In India, there has been a strong contract between Ahmedabad and Delhi. In Ahmedabad, the BRT has received very high acceptance from the public, society groupings and at political level. The system is called Janmarg ("the people's way") and is accepted as cutting across classes and other boundaries. It is seen as a transport system and has received positive media coverage at home and international praise. By contrast, the Delhi BRT has been mired in controversy from the outset, and has been the target of media criticism. Despite a high level of technical design, it has singularly failed to gain public and political support. The consequence is that whereas Ahmedabad has been able to progress to significant system extensions and is now more than 80 km of BRT, Delhi remains at just 6 km of BRT (Rizvi).

Promptness or delay in implementation may also be a factor. In Delhi, the project duration has been very long. From one side, this has led to a certain fatigue among the public. From another, there has been too much change in key people (Rizvi). The same has been observed in Accra where the BRT has also taken far longer than the original projection, and all original personnel have moved on (Gyamera, Finn).

In Delhi, the Metro became quite adversarial towards the BRT, and vice versa. This meant that there was not a unified position in relation to public transport, and led to very visible discord. By contrast, in Ahmedabad the promoters of Janmarg specifically excluded the area of proposed Metro from their design, and avoided any conflict at public or political layers (Rizvi, Finn).

In Australia, BRT has been broadly successful in winning "hearts and minds", but the results are mixed. In Adelaide, there has been high success. In Brisbane, the attitude is positive, but long queues at the river bridge are a tangible issue. In Melbourne, the BRT is popular, but people still prefer the long-established tram system. In Sydney, BRT has not succeeded to capture the public interest, and is now being replaced by a rail-based system (Currie, Clifton). It may also be an issue of visibility. The impact at an individual BRT or bus stop may be quite modest, but when summed across the entire city it can be substantial. This may be overlooked in public opinion (Currie).

In Sao Paolo, public support was built in a quite different way. The initial step was to implement conventional bus lanes in smaller streets. This enabled buses to move more freely and offer a better service. The principle was demonstrated and accepted, and this achieved a higher public support for the more significant BRT measures (Lindau).

In Bogota, the Transmilenio system is the world's highest capacity BRT system, and perhaps the most technically successful. Nevertheless (or perhaps because of this), there is a level of dissatisfaction among users at issues such as overcrowding and unpleasant travel conditions. The political commitment to BRT under former-Mayor Penalosa has dissipated, and the political position now oscillates between strong support for replacement by Metro and delays in refurbishing the BRT (Hidalgo).

There are innovative approaches to building public enthusiasm and support that have been employed in different BRT systems (e.g. pre launch free trial operations in Ahmedabad, and prototype station construction to solicit feedback). A better understanding of the successful techniques and tools is likely to improve BRT outcomes (Rizvi).

Ultimately, the issue may be to properly understand the decision-taker, and indeed to identify who is the real decision-taker. It is all very well to formulate arguments and justifications for BRT, but unless these anticipate and are well-directed to the real decision-takers and opinion-formers, BRT risks being marginalised (Patch, Finn).

3.6. Key capabilities must be developed

Public transport development and integration is complex. It requires a good combination of three essential factors (1) political leadership; (2) technical capacity; and (3) funding. If corners are cut during planning, a city will pay for it during implementation (Hidalgo).

Analysis of 121 BRT systems indicates that the three primary factors are frequency, connectivity and visibility (Hensher). The priority for passengers is to get to their destination. Time is important, but must be calculated as the sum and variance of all the parts of the journey, and not just the speed of the trunk section of the BRT. Seating availability is also important, especially in developing countries where most paratransit users have a seat (Finn). Technical capacity must be developed within the project implementers. Once developed, it must be retained. This is a serious challenge in developing countries (Manana).

The essential elements for BRT are: (1) Central Control; (2) Mass Transit image; (3) Efficient bus operations; (4) Performance- and customer-oriented management; and (5) a commercial business model. The critical design elements are: (1) Adequate station capacity and intersection control; (2) overall system capacity; and (3) commercial speeds (Olyslagers).

Forecasting of ridership, revenues and costs needs to be developed further. In practice, this is quite weak. For example, in one Brazilian city three different studies were performed and each produced a significantly different forecast (Dantas). Operational systems need to be strengthened both at the bus operations control centres and the traffic signal controls. It is not unusual to encounter signal cycle times in excess of three minutes, such as in India and Indonesia (Finn) whereas the combined bus frequency is less than 20 s. AVM and traffic control systems need to be redesigned for the intensity of BRT operation, and to reflect the extreme usage and impact on operational and financial performance. For example, in a high-intensity BRT system, every traffic signal could be activated 8 million times per direction over the system lifetime. Even minor improvements in effectiveness could yield large benefits, and would justify significant development investment (Finn).

3.7. There are significant differences between BRT in the developed and developing world (or 'mature and emerging systems'), in particular in terms of frameworks and goals

First, it must be acknowledged that there is a very wide range of practice in BRT globally. Although the number of BRT systems worldwide now approaches 200, it has been very difficult to define what exactly is "BRT"? There is often heated debate about what qualifies as BRT, and definition efforts such as the "BRT Gold Standard (ITDP, 2014)" have not met with universal approval. Thus, difference is innate to BRT.

Second, it must also be acknowledged that there can be a very wide range of practice of BRT even within the same country. This is not only at the technical and operational levels, but also even in terms of the institutional arrangements. This is particularly evident in countries of a federal nature where different states may have

Theme	Recommended research items
Creating the conditions for acceptance of BRT	• Identification of the "*key to success*" elements on which policy-makers and practitioners should focus, taking account of the context, urban scale and socio-economic conditions • Practice and effectiveness of influencing decision makers, including through the general public, by showing them an attractive but realistic vision for transit. • Research into why a wide range of stakeholders (public, politicians, media, incumbent operators…) unconditionally support rail systems and may be hostile towards proposals for bus-based transit; and into how such attitudes are formed or promoted.
The contribution of BRT to achieving urban and transportation policy goals	• Systematic gathering and analysis of evidence regarding BRT economic and social impacts. (It was noted that in some countries the capital investment for a BRT may be below the threshold at which in-depth impact analysis is mandatory, so that evidence of impacts is not available for BRT whereas it always would be for rail-based projects). •Review and assessment of projects/ programs that were specifically intended to be transformative, identifying gaps between what cities planned and what they actually delivered. •The effectiveness of BRT in land use densification, and relevant influencing factors. • Assessment of which land use planning features or policies should complement the public transport intervention (context dependent). • The effectiveness of BRT in influencing car or motorcycle use or ownership, and the specific policy measures can boost its effectiveness.
Relationships with the existing transport operators	• Examination of the relationships between BRT and paratransit including: (i) the roles that paratransit can play in a BRT-based transit network; (ii) development of options for a hybrid system, and assessing their feasibility; and (iii) whether the paratransit sector can be formalized in the absence of or independent from BRT. • Transversal study in how the incumbent operators evolve into (or are displaced by) larger transport operators.
Financial sustainability of BRT	• Policy and practice regarding financial viability of BRT and subsidies, including (i) conditions under which BRT systems can recover all operational costs, including vehicles; and can recover operational costs and system management costs; (ii) the tariff levels at which BRT can be self-sustaining; (iii) the magnitude of subsidies in BRT systems, and comparison to pre-project forecasts; and (iv) comparison of the financial performance of BRT with the modes it replaces or displaces. (Note that this is not about whether subsidies are desirable or justified in themselves). • Business models for BRT, and the extent to which they are structured to encourage optimal service, quality and commercial performance.
Organisation and operation of BRT	• Organisational and technical capacities required for the BRT implementation agency. • Assessment of practice and any evidence on whether and when a trunk and feeder system may be more or less preferable to one based on direct service. • Assessment of practice and effectiveness of how complicated networks and services are explained to users. • Safety design and related operational guidance for BRT operation and infrastructure. Specific items include safety for standee passengers in higher-speed buses, and the interaction between BRT buses and soft modes. • The relationship between system design and universal accessibility, in particular in high-intensity BRT system.
Understanding the diversity and needs of the customer base	• Enhanced understanding of the needs of different user groups (including children, elderly and women) whose travel patterns and personal requirements may not be the same as the commuters for whose mass movement BRT is usually designed. • Practice and possibilities for product and market segmentation in BRT (e.g. air-conditioned buses, seating-only buses), and whether such segmentation is desirable.

quite different approaches – e.g. Australia (Currie), Brazil (Dantas) and India (Rizvi).

That said, it remains that there are some fundamental differences that go beyond normal variance between BRT in the developed and developing worlds (some flexibility is required on where to position countries of Latin America). This is especially evident at four levels:

1) Developing countries more typically have rapidly growing cities and underdeveloped infrastructure. For them, BRT is an essential and affordable form of mass transit, which can be implemented in the same timescale as the urban growth. This is reflected in more 'massive' infrastructure and intensive services – e.g. Tanzania (Mfinanga), Accra (Gyamera), Manila (Brader), Cali (Hidalgo) and Sao Paolo (Lindau).
2) Developing countries typically have underdeveloped institutional and regulatory frameworks. BRT often acts as an agent of transformation, and there is at least as much effort in institutional and framework development as in organising the BRT itself. This is particularly evident where new institutional structures have been required in Accra (Gyamera), Dacca (Olyslagers), and Dar es Salaam (Mfinanga). It is also evident where significant change and realignment has been required to existing frameworks such as in Ahmedabad (Rizvi, Finn), Jakarta

(Finn), Santiago de Chile (Munoz), cities of the Philippines (Brader), and cities of Brazil (Dantas).

3) In many developing countries, there is a significant paratransit or incumbent sector that needs to be included in the process. In some cases new BRT operators are explicitly formed from the existing sector, as in Accra (Gyamera), South Africa (Seftel, Browning), Jakarta (Finn), Lagos (Finn), Cali (Hidalgo) and Santiago de Chile (Munoz). In other cases, there is a general intent to offer participation opportunities that could be difficult to achieve in practice, or there is an upfront acknowledgement that the sector does not have the capacity to provide the BRT services and is otherwise relocated or compensated, as in Philippines (Brader) and Brazil (Dantas).
4) In developed and self-sufficient countries, the BRT framework, requirements and design are determined by the city or national authorities. This is seen in Australia (Currie, Clifton), Korea (Finn) and South Africa (Seftel). In developing countries, the external lending and development agencies play a strong role in financing, and also have a significant say in both the frameworks and the business concepts. This can bring advantages in access to knowledge, finance and discipline, but can also bring obligations, constraints and an added layer of administration. Such projects are seen in Accra (Gyamera), Philippines (Brader) and Tanzania (Mfinanga). At the extreme, parallel BRT projects in the same city can end up with different organisational and technical concepts due to being supported by different agencies, as seen in Bangladesh (Olyslagers).

Recognising the very different urban contexts and transportation objectives, the point of convergence between the developed and developing countries is likely to be the goal of ridership growth. Whether the underlying goal is social equity, urban sustainability, transport efficiency or commercial profit, all BRT projects seek to increase ridership and mode share. All BRT projects also seek to improve technical efficiency, throughput and service quality. These are likely to provide the points of shared interest between policy-makers and practitioners in very differing environments that do not usually collaborate.

4. Recommendations from the Workshop

4.1. Research recommendations

The workshop identified a set of recommendations for further research. Many of these issues arise from the challenges faced by policy-makers and leaders in city and national authorities who must address mobility needs within the broader urban context, and by the practitioners who must design, deliver and manage the BRT systems. The workshop highlighted the need for effective engagement among the research, policy-making and practitioner communities.

The workshop noted that most of the list of research recommendations from the 2011 Thredbo workshop remains valid. The following items were additionally identified:

4.2. Policy recommendations

The Workshop proposed the following recommendations for policy:

- At both policy and planning levels, BRT needs to sit within the development of the city itself, and the development of the urban passenger transport of the city. BRT should not be designed or deployed in isolation without regard either for its impact on its context environment, or of the opportunities that its context environment provides.
- BRT should not be burdened to solve the city's or society's problems, nor allowed to be used opportunistically by others to advance their own agendas. If BRT should be a 'problem-solver' or 'agent of transformation', this should be explicitly stated, it should be given adequate resources for the additional responsibilities, and it should receive the political backing to implement the emerging multi-faceted solution
- BRT needs to be based on coherent and efficient business models. These need to be at the heart of the design process, planned from the outset, with as much attention to them as is given to the technical aspects. They should not be an afterthought.
- For complex and extensive BRT systems, there is a need to devise an intermediate option between the current choices of "Big bang" and "gradual implementation", each of which has its merits but also contains risks of failure. Due to the limited number of analysed cases to date, this policy issue is framed as pertinent questions:
  - Does experience suggest 'big bang' approaches yield stronger long-term outcomes than incremental approaches?
  - What role does context play – under what situations should one alternative be favoured over another?
  - Are interim solutions feasible, and if so are they preferable?
  - Does experience show that fare integration is a necessary first step in all cases?
- BRT design should be appropriate to context. BRT solutions from one context, no matter how successful, should not be imposed on another context.
- Rigorous and sustained management structures and tools must be used to deliver the planned capacity and outcomes. The different needs at the planning, delivery and operational phases must be recognized and adequately resourced.
- BRT design knowledge needs to be codified and formalised, and subject to testing and rating.

4.3. Recommendations for Thredbo 14

The Research and Policy Recommendations in the preceding sections, supported by the Papers and Workshop Discussion, provide the main outputs from the Workshop. They are suited to immediate use.

There are some remaining questions that we hope will continue to be covered by Thredbo and by our community of researchers:

- How can bus transit be used as a transformative tool for cities and for transportation stakeholders?
- Have mature transit agencies (i.e. in developed countries) changed themselves or their methods then they implemented bus transit, and if not, have they missed opportunities?
- Has implementation of bus transit led to changes in policy or in perception by key stakeholders?
- Should BRT be primarily a *client of* or a *contributor to* knowledge in the core Thredbo themes
  - Competition, Ownership, Regulation, Contracting, …
- Should we continue to have a separate BRT Workshop within the Thredbo Conference?
  - Maybe: Planning and Implementing Integrated Transit Systems and BRT?

- Should be pay greater attention to the "How" rather than the "what"?
- How do deal with the significant Developing and Developed world differences, including research and conference structures?

Participants in the workshop

The material in this report is based on the papers and the workshop contributions of the participants. The participants were Marco Batarce, Paul Browning, Aileen Carrigan, Geoffrey Clinton, Simon Cowen, Nicholas Cronje, Graham Currie, Andre Dantas, Brendan Finn (Rapporteur), David Hensher, Dario Hidalgo, Robin Kaenzig, Karl Kottenhoff, Toni Lindau, Sam Lucas, Thumbu Mahlangu, Khibi Manana, Yolisa Mashilwane, David Mfinanga, Rosario Macario, Juan-Carlos Munoz (Chair), Frits Olyslagers, Wayne Patch, Andrea Rizvi and Eric Trel. Their contributions are gratefully acknowledged.

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[1] All references from the Thredbo 13 Conference (2013), unless otherwise cited. *
Papers presented in Plenary, but included in the workshop discussion and analysis.

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Workshop 3 Report: Institutional and operational reforms within different socio-economic and cultural contexts

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ABSTRACT

The discussion and conclusions of Thredbo's Workshop 3 are summarized. History and the socio-economic environment is a condition that should be considered as a most important fact when moving into planning public transportation. Contradictory targets should be identified and avoided *a priori.* Income distribution and spatial segregation should be taken into account, together with the necessary transparency and responsibility of parties involved.

1. Introduction

The participants of this Workshop had a clear objective which is motivated by more than thirty years of worldwide reforms in many directions to increase efficiency and control costs. Public transport markets present a variety of arrangements regarding operations, control and ownership that are amenable to improvement. Therefore, in this workshop we examined the contextual economic, political, cultural and social factors behind the many different cases that can be observed around the world. Factors such as income distribution, habits and traditions, institutional arrangements, entrepreneurial behaviour or non-declared goals, emerged as quite relevant for public transport planning. Through a better understanding of such factors, we studied the options regarding competition and ownership for regulated (public) transport markets, taking full account of local contextual factors.

In this report we describe the way the workshop was organized, we highlight the specific issues addressed in the presentations that fed the discussion and we synthesize the agreements and recommendations reached on the many aspects that emerged.

2. Organization and brief overview of the content of the workshop

The discussion of the nineteen participants from ten countries was developed in two steps. First, thirteen papers were presented and discussed in detail. As a result of the substantial diversity of modes, cultures and aspects analyzed in each paper, we organized the presentations around four main topics and subsequently clustered into four sessions. Second, we integrated all issues and the findings of each topic into a general discussion aiming at consensus on what were considered the most relevant points and potential solutions/recommendation.

The four topics identified were reforms in public transport in different socio-economic contexts, normative views regarding reforms, organization of the industry and institutional issues. The following paragraphs provide a brief summary of the content and main points present in those four topic sessions.

2.1. Session 1. Analyzing reforms in different socio-economic contexts

This session was kicked off by Jackie Walter's presentation on the role and responsibilities of government in support of public transport services in South Africa. He particularly focused on the

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South African bus contracting systems and their effects in time and also discussed the role of organized labour (tendering seen as privatization) in great detail. One of the key findings of his paper is that difficulties with global public transport reform are not only caused by cultural aspects but often also a result of financial issues and unwillingness of provinces and regional/local government bodies to take on an active public transport authority role. Particularly in South Africa affordability and complexity appear to be the key reasons for the reform not being more successful so far. Sotaro Yukawa then took the discussion to a totally new level given cultural background, by looking at what occurred when the government recognized the responsibility for regional public transport in Malaysia and comparing the experience with Japan. A key concern of his paper, and something that we agreed on later to be similar with a lot of cases globally, is the problems resulting from fragmentation in administration and funding in public transport. Seidel and Vakkuri found similar issues when applying institutional theory (large variety of models, such as contracting in, contracting out, competitive tendering) and transaction cost economics (cost of running and administrating transit) with a focus on bounded rationality in their comparison of public transport reform in three pairs of cities in Finland and Germany. While all these cities were very specific in their characteristics (e.g., Wuppertal and its suspension railway), which may be an excuse for in-house provision, their study found two commonalities across the six different cases. One is that in all cases the reforms replaced old problems with new ones, and the second and more encouraging one is that in all cases customer orientation has improved, which is usually seen as an important outcome. In the final paper of the first session Paget-Seekins et al. took the discussion again to a different cultural environment by revisiting the regulatory reform of bus operations in Latin America (with cases from Santiago, Bogota and Mexico City). A key finding of this descriptive analysis of pre-post reform states is that there appears to be, despite all socio-economic and cultural differences (for example family business driven bus operations in Santiago with two buses per operator not being unusual pre-reform, or a key characteristic of Mexico city's reform being to accommodate for the fact that their users hated transfers) across Latin America (and we would say even globally) a reoccurring regulatory cycle (primarily from public provision to competition in the market to competition for the market).

2.2. Session 2. Analyzing reforms: normative views

The first paper in this session by Gschwender et al. focused on the normative question of whether feeder-trunk or direct lines would be more appropriate when determining the optimal structure of transit services. For their case example in Santiago, Chile, they were able to show that feeder-trunk is inappropriate for the levels and structure of demand experienced in that type of city. While the feeder-trunk system benefits from economies of density and high frequencies on the big avenues, it is associated with the problem of mandatory transfers and not offering many direct trips, which affects negatively users' cost. Holmgren's paper then looked beyond network design and discussed strategies for increasing public transport market share with examples from Sweden. Interestingly, the key finding of this paper is that Swedish transport policy did not implement a model that would have maximized social welfare. Holmgren's model offers an alternative normative model and illustrates what a welfare maximizing policy would look like in terms of fare and supply levels (vehicle-km) in regional public transport and the impacts on patronage. Specifically he showed that by increasing or reducing public transport fares in different counties patronage would grow significantly and additional subsidies would be needed.

2.3. Session 3. Organization of the industry

Merkert and Hensher's paper on open access for railways and transaction cost economics examined whether the European approach is appropriate for all of Australia's train operations. It shows that it is important for public transport provision and regulation to focus not only on the regional context but also on the structure of the relevant industry, in their case railways. A key finding of their paper is that one has to examine the entire transport value chain in order to make efficient decisions on how to organize and regulate freight and passenger transport. For regional or dedicated lines (such as iron ore lines in Australia) that are not connected to the main network or any public transport operation, a federal regulatory system of open access is perceived (by senior rail management) as counterproductive albeit those lines being very different to the rest of the network both in terms of value chain organization and operations. Santa found similar issues when looking at the last twelve years of rail reform in Italy. While his paper highlighted a number of achievements, the key problems were related to institutional arrangements and the fact that regional rail operators are not connected to main lines, and hence only governed by regional laws but not by EU directives. Aarhaug's paper then took the discussion to a mode that had not been discussed so far: taxi operations. In his detailed study of taxi service reform in Norway (including a comparison with Sweden and Denmark) he established that competitive tendering seems to be working in large cities (where prices have dropped and level of service increased as a result of introducing competitive tendering) but in regional areas it has not, largely because competitive tendering is less efficient in entry regulated markets. In that sense Dementiev's paper offered a complementary perspective by discussing the Political economy of ownership change in suburban railway transport in Russia. His game theoretical analysis of Russian Railways as a regulated monopoly and public transport authorities potentially entering public private partnerships for the provision of suburban railway services, offers both sides an optional choice for more transparency (paid by a share in the venture).

2.4. Session 4. Institutional issues

In his second paper Dementiev discussed the relationship between social capital (including trust) and public transport based on the example of Moscow students, and hence focused on the case of an economy in transition, where competition is assumed to be imperfect. De Sousa and Orrico's paper took the discussion on imperfect competition further by analyzing the Brazilian bus transportation networks. Their findings suggest that bus contracts in Brazil are currently too large and long (10–20 years) and that more competition, particularly in the operation of a corridor would be beneficial. Their preferred model would be the introduction of on street competition on common corridors (two franchises/lines that somewhere overlap on a common corridor), which in our view may bring complications in addition to the presented benefits. In the final paper of our session, Spandou and Macario presented a detailed description and institutional analysis *of urban public transport systems with a focus on the case of New York City*. They highlight that it is not only relationships but also financial flows between the involved institutions that matter.

Besides the main authors of each paper, participants included CEOs and directors from public transport corporations and authorities in South Africa, senior transport consultants from Europe as well as senior academics from Oxford University (TSU), Tampere University (Finland) and the Federal University of Rio Grande do Norte (Brazil).

3. Discussion and conclusions

Two structured discussions on the specific papers were held after sessions 1 and 2 and after sessions 3 and 4 with the participation of all members of the workshop. After all elements emerged, the participants collectively and individually constructed statements that were enriched, corrected and/or amended in an open discussion until convergence was achieved. Given the very positive result obtained it is worth summarizing the "Algorithm for Convergence":

1 Proposal of statements;
2 Arguments in favour and against;
3 Reformulation of the statement;
4 Back to 2 (iteration)
5 Consensus

After this process of arguing and counter-arguing using the elements, cases and examples presented, we concluded the following, regardless of cultural and socio-economic differences:

- *We do witness contradictory or unclear targets* which make it very difficult to do actual planning, implementation and operation of public transport. For instance maximize social welfare together with avoiding subsidies by imposing self-financing policies (as in Transantiago, Chile) or defining unclear pricing objectives (Sweden).
- The fact that *regulation in public transport behaves similar to a pendulum* constrains the achievement of long term objectives.
- Socio economic characteristics such as *income distribution* or *spatial segregation* and behavioural issues (e.g., security) are essential elements but usually forgotten or insufficiently prioritized in transport planning, as exemplified by the cases of South Africa, Malaysia and South America.
- In many parts of the world, public transport is important for economic development. As wider economic impacts now are a key part in Cost Benefit Analysis, *inequalities between regional/peripheral/underdeveloped and metropolitan/centre areas should be taken into account*.
- When contracting out or tendering, it is essential to take into account the content of the contract (measures behind goals), contract length, type of ownership and enforceable instruments (a lesson from the Santiago case).
- When providing public transport services internally (as an administration or vertically integrated), there is a similar if not increased *need for transparency, rules and responsibility*, as illustrated by Norwegian and some other railways.
- When open access to public transport infrastructure is deemed useful, coordination and view of entire supply/value chain are important (Brazil, Australia).
- Competitive Tendering or Negotiated Contracts can be an opportunity when neither the in-house nor the fully deregulated option do the job well, but can be inappropriate if introduced for exogenous reasons only (e.g., financial burden results in lack of city planning; Brazil).
- Even vertically separated train operations can exhibit economies of scale in terms of user cost (not necessarily in operating cost), which is why we have franchises, etc.
- Some degree of competitive pressure (for example in combination with benchmarking) is always healthy, as illustrated by some examples in Brazilian corridors.
- In order to be able to set optimal prices in public transport, *subsidization is needed which can reduce over time if appropriate target setting is in place*.
- Proposed institutional arrangements must consider the desired objectives, but we should be aware of *history (path dependence) as it shapes the way institutions have evolved* as well as the way people look at/perceive public transport.
- Involved parties should participate and also be made responsible for public transport actions.
- The way public transport is planned and implemented shapes (among other things) the way society perceives democracy and political systems. There are substantial differences across the world (e.g., Russia).
- Sometimes public transport does not get enough priority in the political decision making process unless there is a "sexy" project, and then it gets built for the sexy factor rather than project appraisal (e.g., cable cars).
- Public transport is undervalued in terms of building social capital in terms of equity, education, social cohesion, wellbeing and happiness (e.g., Republic of South Africa, Russia).

4. Final remarks

Although a number of issues emerged from the presentations and subsequent discussion, there are some general aspects that appear as key elements in any attempt at building institutional and/or operational reforms in different socio-economic environments. History and the socio-economic environment is a condition that should be considered as a most important fact when moving into planning public transportation. This factor indeed influences feasibility and induces some conditions when contracts have to be designed either to call for a competitive tendering process or to negotiate between a private operator and the state or local entities. No factor should be left aside because of dogmatism: sometimes subsidies should be considered from the start, but the appropriate tools to verify the fulfilment of obligations have to be present as well. The pendulum from full regulation to full deregulation and vice-versa seems damaging.

The success of the right level of regulation depends on the a) targets, b) planning (technical, local context), c) instruments and d) time required for implementation. The discussions in the workshop have shown that there are many parts of the puzzle and that in most cases the local context matters substantially which includes the habits of operators, public transport authorities and also of users. Interestingly, relationships appear to matter regardless of the region/jurisdiction under consideration as contracts/instruments are only one part (and trust and good relationships the other) of making (public) transport systems work.

Future research in this topic has to accept a basic premise: socio-economic environments differ greatly across countries and there seems to be a lack of a systematic account of what happens in poor, middle income and rich countries, regarding their experience with the many different policies in the transport sector. The world can be considered a "living laboratory" where a variety of different options have been taken in the medium run with results that can be observed and studied. Within the developed world it is a fact that urban transit in European cities is – in general – viewed and treated differently from what is done in the U.S.A. Also, transit patronage is much larger in Latin American, Asian or African cities So the people in charge of urban development in places where transit riders are a large majority, can see, study and assess the courses of action taken in the northern hemisphere before embarking into loans to finance investments in the transport sector or into new managerial schemes. Smartly designed contracts, optimal pricing-subsidies schemes, and the design of the main characteristics of transit systems should be conceived and implemented taking into

account those socio-economic, institutional and behavioural differences.

List of papers presented

Aarhaug, J. *Competitive tendering in an entry regulated market – An accident waiting to happen?*
Dementiev, A. *Political economy of ownership change in suburban railway transport in Russia.*
Dementiev, A. *Public transport and social capital: The case of an economy in transition.*
Gschwender, A., Jara-Díaz, S., & Bravo, C. *Feeder-trunk or direct lines? The determinants of the optimal structure of transit services.*
Holmgren, J. *A strategy for increasing public transport market share – An investigation of an alternative development.*
Merkert, R., & Hensher, D. *Open access for railways and transaction cost economics – Is the European approach appropriate for all of Australia's train operations?*
Paget-Seekins, L., Flores, O., & Muñoz, J. C. *Revisiting regulatory reform for bus operations in Latin America.*
Seidel, T., & Vakkuri, J. *Understanding market-oriented reforms in local public transportation – Results from Finland and Germany.*
de Sousa, M., & Orrico, R. *Theoretical essay about the imperfect competition in Brazilian bus transportation networks.*
Spandou, M., & Macario, R. *Institutional analysis of urban public transport systems: The case of New York City.*
Stanta, F. *Twelve years of rail reform in Italy: Achievements and problems.*
Walters, J. *The role and responsibilities of government in support of public transport services in South Africa.*
Yukawa, S. *What occurred when the government recognized the responsibility for regional public transport? Case study in Malaysia.*

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Workshop 4 Report: Governance, ownership and competition in deregulated public transport markets

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ABSTRACT

This workshop discussed the functioning of deregulated public transport markets, examining competition options for deregulated markets. The regulatory needs of such market initiative 'deregulated' markets have been considered both from practical and theoretical evidence, covering both local and long-distance markets (bus, coach and rail). Practical evidence has been presented from mature deregulated markets (such as buses in Great Britain outside London) and updates on experiments in countries such as Japan, New Zealand and Sweden. Emerging evidence on the liberalisation and deregulation of long-distance and international markets in Europe and elsewhere was considered, both for coach and rail. The devising of 'rules of the game' formed a centrepiece in the discussions, looking at alternative ways to organise the regulatory guidance of such markets.

1. Introduction

The main discussion topic within this workshop's theme was: how do deregulated markets work and how to improve their performance? A policy decision in favour of having a regime based upon 'deregulated' market initiative was taken as a starting point for all discussions in the workshop. From there, this workshop discussed ways to optimise the functioning of such markets without questioning that fundamental choice in itself. That means that alternatives to market-initiated regimes – be it a policy decision for public monopolies or for a regime based on comprehensive competitive tendering, by line or network, with or without service re-design freedom for the operator – were not covered by this workshop (see the other workshops of the conference for extensive discussions on the relative merits of negotiated contracts and competitive tendering).

Deregulated scheduled passenger transport regimes constitute one of the main objects of research of the Thredbo conference series. Following the deregulation of local public transport by bus in Great Britain outside London in 1986, and ever since the first conference in Thredbo in 1989, workshops of this conference series have debated the relative merits of 'deregulated' markets versus 'competitive tendering' (van de Velde & Veeneman, 2010; Walters, 2013). Deregulated markets are defined here as those public transport regulatory regimes based upon the principle of market initiative, i.e., *not* those based upon the principle of authority initiative (see van de Velde, 1999 for a discussion of these concepts). The main characteristics of market initiative regimes are that entrepreneurs in these markets are expected to decide autonomously about entry into the market and service supply in the market. Decisions are made on a commercial basis and are as a matter of principle not subjected to a prior ordering by a transport authority. This does not mean that transport authorities should be absent or have no role to play; quite the opposite. Authorities can have various roles in such markets, such as that of a licensing authority checking technical standards, or that of a regulatory authority guiding or restricting entry, or that of a subsidising authority stimulating and guiding supply, or even that of a social-entrepreneurial authority ordering additional non commercially viable services via competitive tendering.

While the British choice for a regime based upon deregulated markets (outside London) appeared for many years to be an

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exceptional and minority case within the regulation of land passenger transport, the last few conferences identified a policy-led growing relevance of deregulated regimes in particular within the European Union. This was visible not only within transport sectors that are traditionally more likely to be organised according to a 'deregulated' regime such as long-distance coaching, but also in the railway sector and to a growing extent in local passenger transport by bus.

The two conference workshops devoted to deregulated markets prior to this conference discussed this growing relevance while papers presented also showed a tendency to slightly re-regulate more mature deregulated markets (Ashmore & Mellor, 2009; Sergejew, 2007; van de Velde & Wallis, 2013; White, 2010).

The workshop held in 2009 (van de Velde & Beck, 2010) showed that deregulation in various guises was expected to play a growing role in local and regional transport in Europe, despite the growing role of competitive tendering as further stimulated by the European Commission's endeavour to enact a Regulation that put forward competitive tendering of exclusive contracts as the preferred way to organise local public transport markets. This growing relevance of deregulated regimes was by then already visible in long-distance scheduled coach operations and, although in an embryonic stage, in some European railway markets from 2010 onwards, while Sweden was discussing options for deregulating its local bus markets (Westin, 2009). While this tendency towards a further spreading of deregulation was observed, the workshop also discussed the simultaneous developments identified in both Britain (especially with the new legislation enacted in 2008) and New Zealand towards fine-tuning and slightly re-regulating the existing deregulated local bus markets.

This resulted in the workshop tentatively designing three conceptual avenues for regulatory improvements to such 'deregulated' regimes. This effectively resulted in hybrid regimes characterised by different combinations of free market initiative and contract awarding by competitive tendering. Several requirements seemed necessary for these regimes to be effective; the workshop agreed on the need to develop and enforce minimum standards as well as a proper functioning of the different relationships between actors, on equipping competent and powerful authorities with a sufficient 'toolbox' to be used with self-restraint, on the need for a definition of services of general interest and a general guidance on the authority's ambitions via a general public transport plan, on the minimisation of entry barriers, and on accepting integration and cooperation between operators as desirable and crucial in delivering appropriate services to the passengers rather than looking at them as collusive features that ought to be avoided.

The workshop held in the 2011 conference (van de Velde & Preston, 2013) continued this investigation of developing hybrid regimes, based loosely on experience in local bus markets in Great Britain, New Zealand and Sweden – the latter still being at the pre-implementation stage by the time of the workshop. Reviewing these and other international experience, the workshop argued that deregulated public transport markets are a global phenomenon but that regulatory measures need to focus on different items to reflect local requirements. To this effect, a hierarchy of regulatory needs was identified according to which, for example, the development and enforcement of the rule of law should be a primary concern (such as in market initiated urban transport in Sub Saharan Africa, or in the then soon to be deregulated inter urban coach markets such as in Germany) while the issuing of further 'rules of the game' (such as guidance for network integration) and the devising of incentives for welfare maximisation would become an issue when basic regulatory needs have been enforced in more mature public transport markets (such as the local bus market in Great Britain, New Zealand or Sweden).

That workshop suggested priorities to policy-makers and regulators of mature markets, in line with the items identified in the pyramid of regulatory needs. An urgent recommendation was to pay more attention to the designing of smarter (i.e., less dogmatic) 'rules of the game', in particular concerning entry timing, entry selection and exclusivity levels. This touch of clever regulation was seen to be largely underdeveloped but of utmost importance to favour the realisation of network benefits and – through this – address related market failure issues, including those that are caused by all-too-dogmatic implementations of deregulated regimes. A second set of priorities that were formulated related to smarter regulation of market entry, with more attention being paid to licensing requirements (referring to professionalism and safety). A third set related to devising incentivised regulation with respect to fare compensations, passenger incentives and supply incentives, particularly to promote innovation. Finally, the workshop wished to remind policy-makers and regulators that new technologies (including 4G mobile phones and smart cards) would make new approaches easier throughout both the developed and developing world, potentially revolutionising the way we currently look at the need for ticketing integration and fares integration.

2. Evidence presented

The workshop held during this conference continued to examine regulatory options for deregulated markets, covering both local and long-distance markets (bus, coach and rail). The main discussion focus of the workshop subsequently was: "how to make deregulation work?" This discussion was fed by practical evidence from mature deregulated markets (such as buses in Great Britain outside London) and updates on countries such as Sweden, Japan and New Zealand, but also by emerging evidence on the liberalisation and deregulation of long-distance and international markets in Europe and elsewhere, both for coach and rail.

The workshop involved 26 participants with 16 papers presenting evidence from seven countries. The papers in the workshop evaluated the functioning of the current regulatory regimes in the local bus markets of Britain, New Zealand, Sweden, Germany, Japan and Zimbabwe, regulatory reforms in the long-distance coach sector in Germany and the US, and railway reforms towards more open-access in the Czech Republic and Sweden.

2.1. Deregulation in local public transport by bus

The workshop started by discussing the updated evidence presented on the functioning of mature deregulated local public transport markets. A welfare analysis (Preston and Almutairi, 2013b) was presented to update earlier findings on the long-term effects of deregulation on the British passenger transport market by bus outside London. While their earlier paper (Preston and Almutairi, 2013a) indicated that deregulation mainly had positive welfare effects, the updated findings found both positive and negative welfare impacts, all depending upon the assumptions made. A study on customer sovereignty shed additional light on the functioning of the deregulated bus markets, looking in particular at its imperfect functioning (Cowie, 2013). It found that some operators were clearly "bad" company focused profiteers, while only a minority seemed to be "good" consumer led operators. It showed that several strategies to make profit can be taken, and that not all of them need to be against the customer's interest. A paper analysing some of the recommendations of the Competition Commission report and subsequent outcomes, discussed some of the implications of the findings regarding possible 'excessive' profit levels in the industry (White, 2013). It found using case studies that high levels of profit could also be associated with higher customer

satisfaction, suggesting that a more refined approach may be needed to distinguish between management behaviours. Unfortunately, qualitative case study papers about existing successes were missing, while developments over the past few years seem to indicate a shortage of adequate staffing and knowledge at the local level to interpret and make full use of the regulatory toolbox provided by the Local Transport Act 2008. We wish therefore to reiterate here a call for further research and publications on this topic, attempting to identify reasons for successes and failures by analysing relevant local factors, such as the local transport policy, level of expertise of the local transport authority, the attitude of the local operators and management style and policy at 'group' level.

The workshop was presented with an update on the New Zealand case, where transitioning from a malfunctioning deregulated bus market to a negotiated/tendered approach is underway (Alexander and Maguire, 2013). The deregulation and divestment of public transport services introduced in 1989 did not lead to the expected results, neither did further corrections to the regime. Interestingly – and unfortunately from an academic perspective – one of the world's most well-thought of attempts to improve the functioning of a deregulated regime, i.e., the set of 'controls' on commercial services made possible by the 2008 Public Transport Management Act, was never fully implemented. The new public transport operating model (PTOM) now turns away from deregulation of urban and local services towards a competitive tendering and negotiated contract regime with a degree of benchmarking and a partnering approach including performance incentives for operators. Inter-regional services are exempted from this regime and remain deregulated. For New Zealand, a strong argument for a fully contracted model for urban and local markets were the relatively thin markets and the low level of commerciality, relative to the significant government subsidy being provided.

Two countries moved towards more liberalised regimes since the last conference and workshop. In Sweden, preliminary results of this move can be drawn as the Swedish law has been enacted in 2012 allowing operators to set up commercial services additionally to public transport services subsidised by the public transport authorities (Bösch, Clark & Smidfelt-Rosqvist, 2013; Jansson, 2013; Ljungberg, 2013; Petersen, 2013). Although the new legislation for local public transport has only been in force since January 2012, the workshop sensed a lot of scepticism about its current functioning amongst the Swedish participants as only a few new commercial initiatives had been made in the local and regional bus markets during the first year. The discussion focussed on what the key drivers could be for a successful increase in market initiative. The discussion revolved around themes such as reliability, geographic availability, integration and ease-of-use. The main priority was seen to be the need to find ways to open the ticketing system for new entrants if any further progress is to be made. This will require a fundamental change of mindset for many authorities.

In Germany, a long overdue amendment of the local public transport law was finally adopted to implement the requirements of European Regulation 1370/2007. While the new law offers an increased number of market access options, it appears that keeping the status quo was the main intention, heavily influenced by most actors of the German public transport sector. As far as we can judge, competitive tendering is likely to remain an absolute exception for the next couple of years, still being observed with great fear and suspicion by both operators and authorities. A further opening of the market, not even speaking of full deregulation, does not seem to be an option that is likely to be realised in the short term, even though the law amendments may have paved the way in that direction (Karl, 2013). This is in contrast to the deregulation of long-distance coach services introduced in Germany in 2013, which has developed towards a fast growing new coach transport network, and this with substantial levels of competition (Augustin, Gerike, Sanchez & Ayala, 2013).

Papers from Japan presented the overall effects of the deregulation of local bus services (Kurosaki and Oyauchi, 2013; Sakai, Shoji, & Takahashi, 2013). While the deregulation has been implemented in 2002, the results seem to have had only little impact on local public transport. Various obstacles and barriers to entry seem to be present, but it also appears that, after such a long time of extensive regulation, the local bus market may need more stimulation to detach itself from its traditional rigidity. A paper investigating the development of price elasticities in the Japanese public transport market confirmed the previous results (Utsunomiya, 2013).

A paper from Zimbabwe examined the extent of divergence or convergence of a wide spectrum of stakeholder views on the form that public transport should take in Harare (Mbara, Dumba, & Mukwashi, 2013). Issues of coordination between a formal and an explosion of informal services figured at the centre of this. It showed how difficult the situation is in Harare and how divergent views are amongst key stakeholders in urban transport operations (public sector, academia, transport operators and users) as to the path to take. The public sector and the academia seemed more inclined to stress the need for conventional buses as a sustainable mode for urban mobility, while inherent advantages were also associated with informal transport, which confirmed the need for detailed studies on how these can be integrated with conventional buses.

2.2. Deregulation in long-distance passenger transport (coach and rail)

Three papers discussed the first findings from the effect of deregulating the rail sector in the Czech Republic and Sweden. The Czech example showed the actions of three competitors on the same route, indicating an uncertain future as all operators are reportedly making losses (Tomeš, Kvizda, Nigrin, & Seidenglanz, 2013). The more successful Italian case was discussed even though it was – unfortunately – not covered by a paper in the workshop. Presentations from Sweden showed that the deregulated rail market shows only little competition for the time being, but it was reported that major entry is scheduled for the coming years (Alexandersson, 2013). Clearly, open access in the railway sector is still at its very beginning in several countries. It will be of major importance for the future of the industry to understand the market developments and performance impact of current and future cases, in particular the current experiences in Italy and Sweden. The workshop expected that further papers on this topic will be delivered at the next conferences.

In contrast to rail, deregulation in the coach market seemed to lead to much faster reactions and even to buoyant developments. A comparative presentation was made of the still very young German long-distance coach market and latest findings of the matured but still vibrant US market, both reporting success (Augustin et al., 2013). The discussion in the workshop showed that other countries with deregulated coach markets also reported successes such as in Scandinavia, Japan and New Zealand. The next opening will be that of the Italian market in January 2014 when existing exclusive rights will expire.

3. Synthesis of the workshop discussions

3.1. Introduction

As the main focus of the workshop was "how to make market based initiatives work?", the discussions were centred on finding

smarter ways to organise a 'deregulated' regime. This revolved essentially around three themes related to whether increased 'guidance' by the transport authority, as regulator of the market forces, was needed to reach this improvement. We distinguished three main means to organise such guidance, each of which will be discussed hereafter:

- The establishment of a public transport policy plan for the territory of the transport authority;
- Measures to stimulate entry and competition;
- Measures to restrict undesirable entry.

Those questions strongly relate to the bell shaped curve discussed at greater length in the previous workshop (van de Velde & Preston, 2013). The key question put forward by that curve is to what extent regulation should be applied. According to this view, the lowest outcomes in terms of supply or welfare effects are to be expected at both ends of the curve, i.e., when no rules at all or absolute comprehensive regulation is imposed. This approach assumes that the right balance of regulatory requirements and entrepreneurial freedom results in the best or 'optimal' outcome.

Four group discussion sessions were organised in order to stimulate the workshop participants to generate ideas and devise ways to improve the functioning of a particular regime. Each group took one country as a reference case and attempted to devise regulatory improvements to improve the functioning of the 'deregulation', i.e., devise rules of the game and other regulatory features that would not only generate more entrepreneurship and innovation on the basis of autonomous market initiative, but also produce greater welfare improvements, compared to the existing regulated or deregulated situation. In a plenary report to the whole workshop, groups presented and discussed their findings, attempting to identify common themes and agreements between the groups.

The countries chosen represented the width of situations presented in the workshop papers. Britain represented the most extensively deregulated market initiative regime. Japan represented an intermediate case, based upon market initiative although with much stability and tradition, and only limited new entry. Germany represented a hybrid case, legally based upon market initiative, but dominated by a history of public companies and functioning under a complex hybrid regime with extensive subsidisation and partly contracting. Germany was chosen here as the recent legal change has reinforced – though imperfectly – its ability to become a 'deregulated' market initiative regime. Sweden, finally, represented a case based on comprehensive competitive tendering moving towards a deregulated regime by being recently opened up to some level of deregulation by the abolition of all exclusivity rights that used to protect the contracted and subsidised services tendered by the transport authorities.

3.2. Transport policy plan

A transport policy plan as a policy document established by the transport authority is common in many parts of the world. It usually analyses the current transport situation and the expected needs for the coming decade or more. It presents the main policy goals of the authority related to transport, usually including planned major investments in transport infrastructure (if any) and the main characteristics of the public transport network. Such a document can form the basis for contracting and tendering a public transport network, if such a regime is chosen. However, it can also become an instrument of regulatory guidance in areas that choose for a market-initiated (i.e., 'deregulated') regime.

The main question then becomes: what should be included in such a transport plan? Should it only include a functional definition of the intended level of service, very much like a functional network definition prior to competitive tendering, or should it be more concrete, indicating precise routes and frequencies, perhaps even timetables? The main threat of such a plan is that the more detailed it becomes, the more it bears the risk of becoming a market entry barrier for commercial services, effectively preventing potentially desirable market innovations by imposing too many costly requirements to entrants. At the other extreme, the absence of guidance through a plan or a lack of quality in its content may also be suboptimal, as potential network benefits may then be jeopardised by an excessive free-for-all situation, preventing the realisation of welfare improvements compared to an unregulated situation. In other words, the more detailed the plan becomes, the more one moves forward the bell shaped curve, ultimately reducing the chances for well-functioning market initiatives. The less detailed, the more one stays in front of the curve, reducing the chances for realising network benefits.

The majority of the workshop participants agreed on the need to have a public transport plan, defined here as a policy document from the local or regional public transport authority, including minimum functional standards for at least major transportation corridors and some indication of service quality (in term of frequency and service period) on those axes. Most participants thought such a plan should also include a definition of accessibility standards for several groups in society. It was agreed that the transport plan should work as a non-restrictive guidance document in terms of service design, even though it should include compulsory integration requirements for all operators. It was felt that the plan should also contain the authority's aims regarding service, ticketing and fare integration, indicating its vision on regulation or effectively guiding the regulator's actions.

The difficulty of the issue of the amount of detail to be included in the plan was very much felt as the participants' discussions did not result in a clear agreement on the optimal level of guidance to include in such a plan. Headway regulation, i.e., the imposition of regular interval timetables, leaving the determination of the actual frequency and departure times to the market, was one such item that was felt to be potentially beneficial to avoid some of the 'bad' practices of deregulated markets (a discussion of this range of practices can be found in Foster & Golay, 1986).

3.3. Measures to stimulate entry and competition

Actual entry or – following contestability theory – a credible threat of entry, is obviously a crucial feature of market initiative regimes. It requires the absence of barriers to entry. The provision by transport authorities of integrated passenger information has been a feature for intervention right from the start of the British bus deregulation but essentially under permissive powers, with a wide variation in extent and quality of such information at local level. Fares and ticketing agreements were seen as anti-competitive and have only become possible since the 2008 reform, while further amendments are pending in terms of making compulsory integrated ticketing possible. The position of fares and ticketing agreements being anti-competitive has now been completely dismissed, with the contrary view given both in the papers presented and in the discussions conducted during the workshop (inspired in particular by the report from the British Competition Commission, 2011) that access to ticketing and fares systems and to passenger information systems plays a major role in reducing barriers to entry in local passenger transport. In short: the opinion was that integration is good and should not be seen as anti-competitive, quite the contrary.

While further legislative amendments are on their way in Britain, the evidence presented from Sweden supported the view that

the lack of openness of the current ticketing arrangements[1] is a likely source for the limited level of entry and competition observed hitherto. Several Swedish authorities have announced that the opening of the ticketing and fares system is their next challenge. Unfortunately, although Britain is more advanced in this field, no paper presented details on concrete actions taken in Britain, on the basis of the powers provided to local transport authorities under the Local Transport Act 2008. Although there was no formal paper, the presentation on the Oxford case by the county and operators provided as an additional component of the conference partly filled this role.

Although some believed there was already enough entry in some markets, such as in Japan, the discussions between the participants led to the conclusion that market entry should be stimulated by further appropriate action by the transport authority. It was agreed that "network effect facilities" (including at least information and ticketing systems, less fares systems) should in particular be accessible to all potential operators.

Many participants expressed the view that the main challenges to encourage market initiative also lie in both the provision of equal access conditions to operators and in the enforcement of a sharing of as much of that information as possible between authority and operators. Information availability was felt to be essential to increase entry by elucidating market potentials in order to enable operators to calculate their actual prospects and risks.

A second means to stimulate entry and/or market initiative is financial incentives. Financial incentives are meant to convert non-commercial services into services that could be provided by commercial initiatives. The opinions of the workshop were more divided on this issue, especially on the possibility or even desirability to replace direct competitive tendering with such schemes. Similarly, the workshop did not agree on whether subsidised (tendered) services should be seen as unduly crowding out market initiative, which is a question of major relevance for the current Swedish case that is still very much in search of a new equilibrium. The idea of passenger vouchers was also briefly discussed as a possible way to help operators finding autonomously prospective market niches.

3.4. Should entry be restricted, and if so, how?

Discussions on whether and how entry should be restricted were less fruitful than those on the need to stimulate entry. The idea was to discuss whether exclusivity should be a feature of a market-initiative regime and whether there are ways to regulate the level of exclusivity given to operational rights.

The major part of the discussions circled around the need to prevent undesirable cream skimming initiatives. The British deregulated bus case is still based, essentially, on non-exclusive rights and the evidence presented to the workshop has not reviewed the slight variations made possible by the Local Transport Act 2008. Restriction of entry by some form of cream-skimming test is seen in Britain in the railway sector but the basis is quite different here as the major part of the market is provided by tendered and contracted services, open access playing only a minor role. Yet, this was perceived to be a well-functioning case of entry restriction test. Its transferability to free markets was not obvious though. While Sweden chose full non-exclusivity in both bus and rail, Germany is now seen to be moving towards a still very uncertain and hybrid regime that accepts the principle of exclusivity (although this might be contrary to some interpretations of the European regulatory framework), yet no variation in degree of exclusivity seems to be part of this new regime. The papers presented did not reveal any smart new practices over and above what has been discussed in earlier workshops; neither did the workshop discussions lead to innovative new ideas. As a matter of fact, the analysis of the Japanese cream-skimming test even led to opposing views on what would constitute cream skimming practices and under which conditions such practices would be desirable or undesirable.

3.5. Some considerations on rail and coach

The workshop was very puzzled by the entries observed in the rail sector in some European countries, the Czech Republic and Sweden mainly, but also Italy and Germany. The dominant opinion of the workshop was that the rail sector is not really suitable for a deregulated environment. It was felt that encouraging competition in this network industry, especially with low (or too low?) track access charges such as in Sweden, bears the threat of costly excessive entry, ultimately resulting in additional infrastructure needs, the costs of which are then shifted to the taxpayer with unclear welfare consequences. Furthermore, it was felt that the life span and extent of the infrastructure investments in this sector were seen to be difficult to combine with the potential volatility of entries and exits, leaving again the taxpayer to foot the bill.

In contrast, there was much more agreement amongst the workshop participants that the coach sector does not suffer from the same issues as the rail sector due to the completely different scope of investments, the different balance of costs between infrastructure and operations, and due to the much simpler technical nature of operations on the road compared to rail. Furthermore, it was perceived that many of the network benefit issues present in local public transport were much less relevant, though not absent, for the coaching business. The papers presented, and the additional discussion, provided evidence of a well working deregulated coach industry, despite voices raising criticism before market opening and expressing strong concerns regarding the competition this could cause to more or less parallel subsidised train services. This was one reason for the German legislator to arrange for a partial protection (i.e., at least one example of partial exclusivity, or 'rule of the game') for local railway services. However, further evidence presented showed with international statistics that train ridership continued to increase simultaneously with coach deregulation.

4. Conclusions

4.1. General remarks

The evidence discussed in the workshop illustrated that deregulated regimes are currently few and far between in European local passenger transport. The slow developments in local transport stand as a sharp contrast with the developments in the long-distance coach markets, where deregulation is gaining grounds at a rapid pace across Europe. This also stands as a sharp contrast with the European Union's actions to deregulate the international and in the future – if the suggested 4th Railway Package goes ahead – the extension of open access competition to the national railway markets; while – in the perception of the workshop – these railway markets seem less suited to deregulation.

A number of workshop participants had general doubts about deregulated regimes, although these seemed to a large extent related to the way deregulated regimes have been implemented, and it appears that dogmatism stood and still stands in the way of improvements to the functioning of deregulated regimes. The regulatory evolutions observed in Britain outside London did,

[1] Those are currently provided by transport authorities for the services they plan and tender out, often under gross-cost contracts.

however, show that improvements are feasible, even if these are slow to materialise. Unfortunately for academic research, the high expectations linked with the regulatory controls suggested in New Zealand in 2008, which were more substantial and appeared to be potentially very beneficial, have not materialised as these regulatory controls have never been truly implemented due to various local circumstances. In particular, New Zealand governments sought more certainty, given the significant government subsidies to the public transport system. This ultimately led this country away from an improved deregulated regime and towards a fully contracted model. Clearly, the lack of champions for deregulated regimes and for finding ways to improve their functioning seems to be a major issue for this type of regime.

It also appears that in many cases of success, deregulated regimes seem to be driven at least to some extent by external factors. For instance, new media and internet technologies have facilitated competition in the coach sector due to an increasing number of simpler information and sales channels. With this, small new operators need to spend less time and effort in gaining market visibility beside the incumbent. The importance of external influences can also be exemplified by the fact that most successful cases of bus deregulation in Britain seem to be highly dependent upon the local authority's anti-car or pro public transport policy, although success is ultimately also dependent upon the management style adopted by the bus operator.

4.2. Policy recommendations

The workshop agreed that no unique solution for all modes and all places could be provided as both technical constraints (rail) and market potential are key drivers for well working deregulated markets. There were, however, a number of points of agreement on at least some of the regulatory needs, such as a need for general safety standards and – contrary to dogma – a general need for finding ways to allow for integration between services, especially when it comes to connecting points between modes.

A major problem for the future of deregulated regimes is that champions for a nuanced view on deregulated regimes seem to be absent. Being a champion for competitive tendering is apparently much easier a stance to adopt, with a simpler message to present; those at whom the lobby is directed more easily understand that message and they are probably also more inclined to be receptive to such a message as it leads to a regime which increases the direct control power of authorities on such a sensible political item as public transport compared to the less predictable results of market-initiated deregulated regimes.

A main recommendation of the workshop was that where deregulation is actually sustained as a regime, and if it is to improve its performance, it will be essential to avoid a repetition of the simplistic and dogmatic interpretations that have dominated earlier implementations of 'deregulation'. A more balanced view will need to be developed and this should be based both on theoretical considerations and on a thorough review of experience, both in terms of performance itself and in terms of the mechanisms that lead to such performance. This includes an appraisal of the regulatory toolbox of the authority, and a better understanding of the stance and origins of the stance of both the authority and the operators. Only this will allow devising the improved 'rules of the game' that are currently still lacking. To function, this will clearly also require clever regulators at the local level. While this may be difficult to realise, we also have to realise that the alternative (good contracting and tendering) is probably just as difficult to realise. In other words, there is no simple solution, whichever the regulatory regime chosen.

In this context, it will also be important to pay more attention to the current development of new 'intermediate' transport modes, such as bike sharing or car sharing systems, not to speak of automatic cars and the like, which are mainly based upon market initiative. This constitutes one of the next challenges in public transport regulation, as the free-market dynamics of those developments currently stands at odds with the regulatory approach taken in the public transport sector that is to a growing extent dominated by contracted (tendered) regimes.

The research recommendations formulated hereafter provide, together with the elements presented above, further advice on elements that need to be elucidated for progress in the field of deregulated market initiative regimes.

4.3. Research recommendations

Future research should continue to focus on the regulatory 'rules of the game' of market-initiated public transport regimes, including changes taking place and the reasons for these changes, such as to draw conclusions on the processes that generate success or failure. More case studies of both good and bad practices are needed to enlighten this debate. This is true in particular for the British bus case but there is also a need for more research on the coach and railway sectors and on the extent to which coordination needs appear in those sectors, especially in view of the developments in the Czech Republic and in Italy. An issue for further thoughts here is to see how market consolidation develops once the gold rush atmosphere disappears.

It would also be helpful if further research could enrich our understanding of the relationships between the entrepreneurial stance of operators, features of the regulatory regime and the behaviour of the transport authorities.

The most difficult research task would be to move beyond the analysis of the current regimes and find the courage to develop new ideas for a clever 'light-touch' regulation of market-initiated regimes. This would include the development of new concepts for what should be included in the three guidance mechanisms discussed in the workshop (the transport plan, entry stimulation measures and entry restriction measures). Cream skimming tests, levels of exclusivity, precedence between social and commercial services, and optimal arrangements for access to 'network effects facilities' (such as ticketing, information, etc.) are only some of the items that need to be studied here.

Research should also include the identification of the most appropriate balance between guidance through prohibition and guidance through financial and other incentives. In this respect, it will be necessary to look in more detail at hybrid regimes combining deregulation with competitive tendering. Several countries have or are implementing such regimes and this is expected to be a growing feature in many markets, especially in the railway sector. While such hybrid regimes appear at first glimpse to give new services a chance, a closer look may reveal that they inadvertently easily hinder possibilities for innovative services.

4.4. Workshop papers

British deregulation and New Zealand regulatory reform

Evaluating the long term impacts of transport policy: the case of bus deregulation revisited, John Preston and Talal Almutairi Transportation Research Group, University of Southampton, UK.
Performance, profit and consumer sovereignty in the English deregulated bus market, Jonathan Cowie Transport Research Institute, Edinburgh Napier University, UK.
An assessment of the Competition Commission report and subsequent outcomes, Peter White Department of Planning and Transport, University of Westminster, UK.

Transitioning to a new partnering approach – New Zealand regulator perspective, Julie Alexander New Zealand Transport Agency Viviane Maguire New Zealand Ministry of Transport.

Swedish bus deregulation and German regulatory reform

The Swedish experiment – results so far and implications for the future based on the need for subsidisation, Anders Ljungberg Trafikanalys, Sweden.
Commercial bus operations in Stockholm – will it work? A simulation analysis, Kjell Jansson Transport Analysis, Sweden.
How will the deregulation affect ambitions for increase public transport use? Stephan Bösch, Anna Clark and Lena Smidfelt-Rosqvist Trivector Traffic AB, Sweden.
Legal and organisational developments in the German land passenger transport, Astrid Karl KCW GmbH, Germany.

Japanese bus deregulation

Estimating welfare change from local bus deregulation in Japan, Hiroki Sakai Faculty of Business Administration, Tottori University of Environmental Studies, Japan Kenichi Shoji Graduate School of Business Administration, Kobe University, Japan Yoshinori Takahashi Faculty of Business Administration, Kinki University, Japan.
Deregulation of local bus services in Japan, Fumio Kurosaki and Hajime Oyauchi Institute of Transportation Economics, Japan.
Local bus services in Japan: price elasticity and public transport policy, Kiyohito Utsunomiya Faculty of Economics, Kansai University, Japan.

Formal/informal sector

Convergence or divergence perspective: multi-stakeholder dialogue on formal and informal forms of public transport in Harare, Zimbabwe, Tatenda Mbara Department of Transport and Supply Chain Management, University of Johannesburg, South Africa Smart Dumba Department of Rural and Urban Planning, University of Zimbabwe Tapiwa Mukwashi Department of Rural and Urban Planning, University of Zimbabwe.

Railway competition

Competition in the railway passenger market in the Czech Republic, Zdeněk Tomeš and Martin Kvizda, Department of Economics, Masaryk University Brno, Czech Republic, Tomáš Nigrin, Institute of International Studies, Charles University Prague, Czech Republic, Daniel Seidenglanz, Department of Geography, Masaryk University Brno, Czech Republic.
Subsidised and non-subsidised public transport side by side – a socio-economic analysis of the Arlanda case, Tom Petersen Trafikanalys, Sweden.
Next stop for Swedish rail reforms? New Government committee reviewing the organisation of the sector, Gunnar Alexandersson The Government Offices, Sweden.

Coach competition

Analysis of the US intercity coach market/A first evaluation of the young long-distance coach market in Germany, Katrin Augustin KCW GmbH, Germany Regine Gerike, Josue Sanchez and Carolina Ayala Technische Universität München, mobil.TUM, Germany.

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Workshop 5 Report: The roles and responsibilities of government and operators

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ABSTRACT

The separation of purchaser and provider requires identification of the respective roles and responsibilities of the two parties. In the spirit of previous Thredbo conferences, we saw it as clear government should be responsible for strategy and operators for operations. That left, as always, the problem of how best to deal with tactical planning as the core issue, and as always there was no simple solution. Government authorities should set the context in the form of contracts, which would inevitably influence the tactical planning process. But it was felt that operators, and particularly smaller locally based operators, would have a better knowledge of the needs of their passengers and of the commercial possibilities of alternative ways of serving them. Thus tactical planning would inevitably involve both government and operator, as well as other stakeholder groups. The workshop also considered issues related to the nature of the government authority that should have responsibility for public transport, the nature of the contract itself and how governments could best create the right environment for contract management, before reaching its conclusions on policy and on research needs.

1. Introduction

As is invariably the case at Thredbo conferences, the workshop had the benefit of a very wide range of experience. We had 14 papers providing information on experience with both road and rail transport and covering ten countries in Europe, South America and Australasia. The same ten countries were represented by a mix of researchers, policy makers and operators.

The subject of the workshop was the roles and responsibilities of government and operators. In the spirit of previous Thredbo conferences, we saw it as clear that government should be responsible for strategy and operators for operations. That left, as always, the problem of how best to deal with tactical planning as the core issue, and as always there was no simple solution. Government authorities should set the context in the form of contracts, which would inevitably influence the tactical planning process (for instance, governments would want to see at least minimum levels of service to all communities above some minimum size). But it was felt that operators, and particularly smaller locally based operators, would have a better knowledge of the needs of their passengers and of the commercial possibilities of alternative ways of serving them. Thus tactical planning would inevitably involve both government and operator, as well as other stakeholder groups (e.g. passenger and community associations).

We heard examples from both The Netherlands and Germany of cases where the operator had been left the main responsibility for tactical planning and there had been disappointment in government at the results. In The Netherlands, this disappointment had led to a very interesting experiment of the setting up of joint development teams from the operator and the authority to perform this function. While the reasons and reasonableness of government disappointment are not explored, it seems that both operators and government find there to be merit in a joint approach. The German Verkehrsverbund is another long standing organisational arrangement that brings together government and operators to plan routes, timetables and fares.

In the following section, we will consider the nature of the government authority that should have responsibility for public transport. We then consider in turn the nature of the contract itself and how best can governments create the right environment for contract management, before reaching our conclusions on policy and on research needs.

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2. The nature of the government authority

Having concluded that public authorities have an important role in public transport, not just at the strategic level but also in at least setting the context for tactical planning, the first big question that arose essentially from Scandinavian experience, but is an issue everywhere, was the question of what government bodies should be involved. There was a variety of experience within the workshop, but in general national governments dealt with national rail networks, whilst regional rail and bus services were the responsibility of regions or municipalities. It was thought to be important that public transport planning was adequately coordinated with road and land use planning, education and health services. However, these functions were often carried out at different levels of government. Moreover, rail planning as well as regional buses tended to require a regional outlook, because of the longer distance nature of the services; whereas purely local buses were best planned at a very local level.

Thus it was not possible to come up with a single prescription to suit all circumstances. What did seem clear was that very often a partnership between different levels of government would be needed. This might be a formal partnership in the form of a joint authority or board, or more informal cooperation. The Swiss approach, in which lower tiers of government essentially worked within timetable and tariff plans set out by national government seemed to work well, but was obviously influenced by the geography and political system of the country and might not be a recipe for all.

It was agreed within the workshop that the abilities of the government body dealing with public transport were key factors in achieving a successful outcome. If it is accepted that public transport should be devolved to lower tiers of government, then an issue arises of how to ensure adequate knowledge and experience, particularly in dealing with rail contracts, where each authority might only hold one or two contracts which only came up for renewal every few years. Moreover, it was noted that in small authorities, staff turnover could be a great problem in sustaining these skills. It seemed essential for the bodies involved to have a means of sharing data and experience as well as having a greater sense of obligation to have a sound understanding and oversight of the contracts that they manage (participants were surprised to hear that this did not seem to be happening in Sweden, one of the countries with most experience of devolved public transport planning and contracting). There might be advantages in a skilled, centralized body undertaking procurement of public transport, although there were doubts about the wisdom of separating procurement from contract management. Using such a body to gather experience, benchmark performance and prepare contract templates, which embodied best practice but could be adapted to individual circumstances, seemed a more promising approach.

A further important issue is the ability to work closely with operators, whilst not being 'captured'. Given the emphasis on cooperation with both public and private sector bodies, the workshop felt that the successful local government public transport officer needed a lot more than purely technical skills. We felt we knew too little about the background and training of such people and how to foster such skills for the future.

3. The nature of the contracts

A number of key issues arose regarding the contracts themselves.

Firstly, if the benefit of the input of a local operator strongly embedded in the community were to be obtained, there would be advantages in a negotiated contract rather than opening the market to a possible entrant without that local knowledge. The workshop was not against such contracts where there was clear evidence that the operator was performing well (again benchmarking was crucial) but was nervous of the possibility of regulatory capture, and felt that the market should be tested by competitive tendering periodically. However, the rail market in Switzerland seemed to be a case where a public transport system largely in public hands (although split between federal government and cantons) had greatly improved its performance, carrying many more passengers with reduced subsidy, as a result of negotiated contracts based on ambitious targets with severe financial constraints, i.e., without the introduction of either competitive tendering or private ownership. In another case, experience in Poland indicated active management by the authority was important to securing quality services irrespective of whether the contractor was a public or private business.

Where competitive tendering was undertaken, there were various things the authority could do to promote competition. Firstly, the size of the lots was important. Very large lots tend to preclude many, sometimes substantial, operators, unless they work in consortia, and the degree to which that was permitted would be determined by competition law (we had an example from Brazil where formation of consortia had helped to ensure that incumbents retained their existing services). On the other hand, having many small operators in an area, especially if they have route-type contracts, makes involvement of operators in tactical planning more difficult, and requires a greater input from the public authority in terms of integration. As always, a balance has to be struck.

Secondly, bidders must receive adequate data, certainly on patronage and arguably also on costs. This is not usually a big issue when the incumbent is publicly owned as the authority should have access to the data and the right to share it with bidders (although when a publicly owned company has the structure of a private company, such as Deutsche Bahn, this can still be an issue). We had one example where bidders for rail contracts in a German city had to conduct their own patronage counts for the existing system to obtain data needed to prepare tenders. Obviously the incumbent will be reluctant to share data, and there may be difficult legal issues if the incumbent is a privately owned operator previously running services on a commercial basis or on a contract which did not adequately provide for the public authority to obtain and share data.

Thirdly, the public authority should take on risks that are outside the operators' control. This could extend to overall revenue risk in the case of gross cost contracts for parts of a strongly planned and integrated regional network, although other quality-related incentives will then have to be included in the contract. Alternatively, it could include that part of revenue risk outside the operator's control. For instance, rail franchises in Britain now include an adjustment for the estimated effects on revenue of different rates of GDP growth than that anticipated at the time of the tender. The same approach could be taken to, for instance, petrol prices or traffic speeds.

On the cost side, general changes in costs such as fuel prices and labour costs might be borne by the government (but not of course the actual changes experienced by the firm, so that they still have an incentive to minimise the impact on their business of the national trends).

It may be objected that such measures are relieving the private sector of risks that in most spheres of business they would have to take on themselves. But in most spheres of business their ability to manage the risks would not be constrained by a contract limiting their freedom of action. Moreover, if the result is to attract more competition, reduce the introduction of risk premiums and reduce the risk of contract failure with its resulting costs, the action would seem justified by giving better value for money from the contract.

Competition may also be promoted by the authority owning the assets (depots, vehicles etc) and leasing them to the operator, thus overcoming one of the big barriers to entry: the cost of acquiring the assets and the shortage of locations for depots. This approach may have other advantages in terms of ensuring continued use of assets regardless of who wins the contract and promoting standardisation and attention to life cycle costs rather than simply looking at the duration of the contract. Both factors may reduce costs. But again these represent the public authority taking on roles where the private sector may be able to fulfil them more effectively; giving operators a choice of vehicle for instance may promote innovation. The arguments are differently balanced between bus and rail; the shorter lives and much more active second hand and leasing markets for buses means that there is a stronger case for a public authority owning the assets in rail than in bus. In the bus sector, perhaps there is a middle way; the public authority might own some depots to provide some certainty and availability to operators but with operators also needing to provide additional depot capacity themselves and thus encouraging innovation at the margin that could, over time, lead to changes in the extent and type of depot provided by the authority.

A particular issue arises regarding what happens to the labour of the incumbent operator. In some cases the new operator is obliged to take them on at the existing wages and conditions (this is the case with British rail franchises, and there are similar "transmission of business" rules in Australia to guide such matters). In other cases, as is now the case in Germany, there is an agreement that all the staff of a new entrant should be subject to the same wages and conditions as those of the incumbent. Even in this situation, there may be an issue of how to motivate workers who do not know what company they will be working for at the end of the franchise. Where the incoming operator is free to recruit their own staff and determine their own wages and conditions, as is typically the case with small and less formal bus contracts, the incentives for cost reduction (whether by improved productivity or by worsening wages and conditions) are greater. But so too are the risks of discontent of workers in the industry, and this may spill over into industrial action.

Finally, the question was raised as to whether contracts should be exclusive, or whether there should be the opportunity for other operators to enter the market on a purely commercial basis. Thus already happens to a degree in the rail market in Europe, and current European Commission proposals might include such right of entry throughout Europe, though with a degree of protection for holders of franchises. In Britain, a large part of bus services outside London are provided without contracts on a purely commercial basis, and scope for this has recently been introduced for buses in Sweden.

No clear conclusions were reached on this issue. On the one hand, such entry might encourage innovation and cost efficiency. There was evidence that in Britain, open access rail operators had lower fares and were highly rated by users for their quality of service. On the other hand, they were likely to increase the subsidies required by franchisees, and reduce the degree of integration of the public transport network.

4. How can governments create the right environment for contract management?

We have argued above that tactical planning should be undertaken by a partnership between public authorities and operators. If such a partnership is to work, then the procurement process, the contract itself and the relationships between the partners must set the right context. The procurement process must have clear and prioritized objectives, avoid the transfer of risk that contractors cannot manage, provide available data to assist tenderers and reduce uncertainty, market test and promote a competitive supplier market, implement sound tendering and tender assessment processes and assemble benchmarking and other market information needed to assist in the assessment of tenders. The contract will need to be very clear about objectives, targets and processes, but not too specific in terms of the exact services to be provided. It will therefore be necessary to include clear and simple variation procedures, based on unit costs (and anticipated changes in revenues in the case of a net cost contract). Appropriate incentives must be built into the contract. Whilst these will undoubtedly include penalties for poor performance, the workshop concluded that cooperative working was more likely to be achieved by allowing partners to share the gains from improvements than by a heavy reliance on penalties. Where penalties were needed, it might be better for working relationships for these to be imposed by an external regulatory body rather than by the public authority directly involved with operators in tactical planning.

Amongst the incentive regimes we heard of, there were interesting variations on the usual ones of revenue or passenger volume related payments. One option was payments based on measured customer satisfaction. This would have obvious advantages where there was largely a captive market, as a payment related to revenue or volume would fail to give much incentive. But there were worries as to whether measurement of customer satisfaction was sufficiently robust for such a scheme to work. Another more radical one was a bonus dependent on the authority's satisfaction with the operator. If it could be made to work, this would be a very useful incentive in systems where the authority and operator need to work closely together, but there was even more doubt as to how to ensure objective measurement in this case.

Having briefly commented on the problem of incentivising the operator, we also thought about the companion problem of incentivising the public authority. Could there be a system of incentives administered by an independent regulator, to whom operators could appeal when the public authority fell short of the performance foreseen by the contract in terms of cooperative working?

5. Policy conclusions and research needs

We considered that the role of government in looking after strategy and of operators in looking after operations was obvious. Thus we devoted our time to discussing the tactical planning area of public transport.

One clear but unhelpful policy conclusion is that what works in practice depends on circumstance. However, we believe that a partnership of public authorities (often more than one layer of government) and operators is likely to best fulfil this role.

That means that flexible contracts are needed, which concentrate more on objectives and targets, and on processes, than on heavily specified services.

The obvious consequence of this is that contracts need to make provision for variation of services in a simple way, through appropriate variations in payments, and must build in appropriate incentives. Such incentives may include passenger (and possibly authority) satisfaction as well as more traditional volume based measures.

Negotiated contracts may be appropriate in some circumstances, and have advantages in harnessing the local knowledge of existing local operators, but the workshop tended to the view that the market should be tested by competitive tendering from time to time. When competitive tendering is used, governments need to promote competition by, inter alia:

- Specifying lots that are attractive to potential bidders
- Providing adequate data to all bidders
- Retaining risks that the operator cannot control
- Ensuring that bidders can acquire the assets they need, if necessary by leasing them to the operator themselves

The capacity of the government authority is as important as that of the operator itself, and consideration needs to be given to how to improve performance of authorities, including by benchmarking and by incentive regimes. Independent regulators have a role here.

Regarding research needs, we see a need for more studies of alternative arrangements regarding the public authorities responsible for public transport planning and procurement, to try to see what works best in a variety of circumstances.

A particular under researched issue is that of the background and training of successful local authority and public transport operator officers. This is important in understanding future recruitment and training needs.

More research is needed into how best to achieve the sort of flexible contract and cooperative working that we see as needed to best fulfil the role of tactical planning in public transport. In particular, how best to provide for variation in services and how to appropriately incentivise this, including measurement of passenger satisfaction.

Papers presented at the workshop

Aarhaug, J., Olsen, S., & Ramjerdi, F. (2013). *Incentives for increasing efficiency in the railway sector — The case of Norway.*

Arbuckle, T. (2013). *Contestability in passenger transport bus contracts — What is the future of private negotiated contracts in Australia?.*

Desmaris, C. (2013). *The reform of passenger rail in Switzerland: More performance without competition.*

Godward, E., Holvad, T., & Capurso, M. (2013). *The reform of Europe's passenger railways: The need for interoperability.*

Guihery, L. (2013). *Regional railway passenger transport in Leipzig region: Opening to competition and operating costs analysis.*

Hansson, L., Lissandrello, E., Longva, F., Naess, P., Richardson, T., & Svensson, T. (2013). *A Scandinavian public transport model? A comparative study of Denmark, Norway, and Sweden.*

Lowe, C. (2013). *Does size matter: Linking governance with performance.*

Melkersson, M. (2013). *Public transport through procurement — Do competent local authorities manage to procure effectively?.*

Rolim, F., Santos, E., & Meira, L. (2013). *Competitive aspects in the metropolitan region of Recife bidding terms for the delegation of its urban bus system.*

Royle, D., & MacDonald, I. (2013). *All change in Sydney NSW, Australia: From permanency to competitive markets.*

Schaaffkamp, C. (2013). *How can customer focus be strengthened in competitive tendering?.*

Seidel, T., & Vakkuri, J. (2013). *Impacts of quasi-market reforms on local public bus transportation actors in Finland and Germany.*

van de Velde, D., Eerdmans, D., & Veeneman, W. (2013). *The emergence of hybrid service design regimes in Dutch public transport — Is co-operation between authority and operator the Holy Grail?.*

Wolanski, M. (2013). *Influence of competitive tendering on perceived quality of public transport — Case studies of two Polish cities.*

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Workshop 6 Report: Delivering sustainable public transport

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ABSTRACT

After a discussion of the meaning of 'sustainable public transport', this Workshop discussed issues of need, system design, institutional arrangements, environmental improvements and social aspects of service. Land use/transport integration was seen as critical for long term strategic direction setting for public transport, backed by sustainable financing/funding arrangements. These need to encompass such revenue sources as externality pricing, user pays, beneficiary pays, wider value capture, asset sales and other opportunities. Such matters are just some of the important examples of governance/institutional design considerations that underpin sustainable public transport, an area the workshop recognised as needing much greater future focus. Ways to grow public transport use, and improve service delivery efficiencies and performance, in both trunk and local markets were discussed, with a particular focus on flexible transport systems. Whether these services should target specific niche markets or pursue a wider customer base was an area of some disagreement requiring further research, in a low density developed country setting. The different roles played by flexible transport systems between developed and emerging countries were notable. The workshop developed a set of general principles intended to further promote sustainable public transport.

1. Context

This workshop continued the Thredbo Conference aim of broadening the public transport discussion agenda beyond contracting and privatisation into wider public policy arenas. To that end, Workshop 6 looks at some aspects of the fundamental public transport value proposition, framed through the lens of sustainability.

The Workshop had 16 participants from seven countries, coming from governmental, academic, NGO, investor and industry backgrounds. This mix provided for a very enlightening discussion. Thirteen papers informed the Workshop, encompassing theory, policy analysis, methods, case studies, ex ante and post hoc project evaluations.

Workshop participants initially structured their discussions around defining what is meant by 'sustainable public transport' and then explored various elements of sustainability, framed around the workshop papers. This discussion encompassed issues of need, system design, institutional arrangements, environmental improvements and social aspects of service, concluding with proposals for policy, research and for future Thredbo Conference agendas.

2. Sustainable public transport

Given the focus on sustainable development since the time of the Brundtland Commission report (WCED, 1987), and the important policy rationale for public transport that arises from its contribution to various elements of 'sustainability', it is surprising that workshop participants were unable to identify an accepted definition of 'sustainable public transport'. Any such definition should link back to the Thredbo 11 Workshop 2 discussion of high-level social goals, towards the achievement of which public transport contributes (Stanley & Longva, 2010). These goals provide a fundamental basis for assessing public transport achievement. In summary, participants in that Thredbo 11 workshop thought that public transport systems and services should be judged against their contribution to the following six social goals (elaborated in more detail in Stanley & Longva, 2010):

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Fig. 1. Understanding personal travel needs.

1. Economic competitiveness
2. Fiscal sustainability
3. Environmental sustainability
4. Social inclusion
5. Liveability, health and safety
6. Regional development

The relative weighting of these goals will differ between jurisdictions but their generality is reflected in numerous national/urban transport policy goal statements.

Against this background, Workshop 6 participants defined **sustainable public transport** as:

Collective transport that, in an on-going way:

- *meets personal travel needs and facilitates strong communities*
- *supports economic development and equitable social participation*
- *promotes environmental health and*
- *has appropriate institutional arrangements and stakeholder involvement (including sufficient sustainable funding) to deliver.*

In terms of the primary role of meeting personal travel needs, Fig. 1 indicates that Workshop participants recognised public transport (PT) provides mobility, which helps people achieve accessibility to a range of activities that, in turn, enable them to meet those fundamental human needs identified by authors such as Maslow (1954). Mobility is important to the achievement of Maslow's five categories of human needs. Because of these connections to human needs and wellbeing, the workshop started from the value position that public transport services need to be equitably distributed (in line with the social leg of the sustainability definition), while also continually seeking to reduce their environmental impact or footprint. Funding, governance and institutional arrangements need to be aligned to deliver a sustainable PT system on the ground.

3. Land use/transport integration

Workshop 3A at Thredbo 12 highlighted that, with the demand for transport being a derived demand,[1] the question of *integration* is always going to be fundamentally important to a successful outcome. That workshop identified a number of areas that require integration, with land use/transport integration being seen as particularly important for maximising the long-term public value of public transport systems. The importance of desired long term land use directions playing a leading role in land use/transport integration was an important conclusion from Thredbo 12 Workshop 3A. Thredbo 13 Workshop 6 participants underlined this point, noting that major transport projects developed in isolation of land use development goals may lead to unintended adverse long-term consequences, such as, for example: not identifying the kinds of public transport system/service development initiatives that are likely to be of most long term value city-wide; accentuating urban sprawl; loss of prime agricultural land. The lack of papers reaching back to integration of land use and transport was noted by Thredbo 12 Workshop 3A participants as a shortcoming and an area that requires attention in future Thredbo Conferences.

Stanley (2013) picked up this issue at Thredbo 13 and, using a current Melbourne case study, showed how an integrated land use/transport strategy is likely to lead to many different public transport development priorities than might emerge from a narrower (public) transport problem-focused approach (e.g. that targets mitigation of road congestion and over-crowded public transport services). In particular, the paper linked structural economic changes taking place in Melbourne to preferred development patterns likely to promote desired economic, social and environmental outcomes, indicating that this wider perspective suggested a much stronger growth role for the city's middle suburbs, in the pursuit of more compact growth.

Public transport service improvements are a key element in the delivery of this development pattern in Melbourne, which is a substantial change from the past pattern of the city's dominant fringe-oriented growth. Focussing primarily on more narrowly defined public transport demand/supply considerations, however, would lead to a much stronger focus on improving radial public transport services to the central business district. While that is an important priority, particularly to support the achievement of further agglomeration economies, maximising Melbourne's growth potential and sharing the benefits of this growth across the city requires a more holistic focus. This goes to the heart of the issue of how the strategic public transport 'needs identification' process should be undertaken. Workshop 6 participants recognised that this process should be an essential component of an integrated long-term land use/transport strategy, not simply a process that considers (public) transport needs in narrow terms.

4. Governance/funding for sustainable public transport

Thredbo 12 Workshop 3A participants agreed that local government acting at a regional level should usually be responsible for driving the process of land use/transport integration, based on the principle of alignment of primary decision taking responsibility with the jurisdiction in which the costs and benefits of those decisions are most concentrated. In some cases this may mean a single local authority, if that authority covers the entire geographic space on interest. In others, it may require some means of local authorities working together to act regionally, as in Vancouver. Higher levels of government (national, state/provincial) often have legitimate interests in land use/transport integration, particularly because of impacts on the high level social goals identified above.[2] It is such impacts on high-level social goals that justify funding flows from the national government to support outcome achievement at subsidiary layers of government, particularly in those

[1] Derived from the demands for the particular activities that people desire to undertake.

[2] Workshop 3A at Thredbo 12 gave some relevant examples, such as the national economic significance of city economic performance in the knowledge economy and the impacts of poor land use/transport integration on this performance.

jurisdictions in which revenue-raising capacity is most highly concentrated at higher levels of government.

While the Workshop did not have any papers that concentrated on the subject of funding, the issue of adequate and stable funding/financing flows was seen as critical to sustainable PT, particularly in the post Global Financial Crisis world, where most governments have been seeking to reduce budget deficits and public debt. Participants observed that, in a time of financial crisis, initiatives that target environmental and/or social objectives are often the first to go. Public transport service levels are at risk in this regard, Preston, Song, and Hickford (2013), for example, noted that Southampton bus service levels had been reduced in the face of local authority funding cuts. Workshop discussion identified several important opportunities for funding public transport system/service improvements.

Externality pricing (polluter pays) – where charges are levied on 'unpriced' external costs created by people's travel choices and (part of) the revenue raised thereby is used to implement initiatives to reduce the size of these external costs. The most common application relevant to sustainable public transport is (marginal social cost) pricing of road use to make road users accountable for all the external costs created by their road use, with some of the resulting revenue used to improve public transport. Workshop participants recognised the importance of ensuring that adverse distributional consequences of road pricing reform were recognised and dealt with, such as by providing better public transport travel options to relevant target groups.

User pays – if pricing of road use is reformed to make users accountable for their external costs, then the argument for subsidising public transport reduces (although distributional considerations remain important policy concerns). Road pricing reform creates an opportunity to improve cost-recovery rates on public transport, which improves funding opportunities for improvements.

Value capture – a form of 'beneficiary pays' funding, in which a part of the land value increase attributable to public transport improvements, or to wider transport/urban improvements, is clawed back (generally from property owners) to help pay for the initiative that generated the value increase. London's Crossrail project was recognised as a current good example of value capture funding. There are a number of forms in which value capture can be applied, such as (for example) a high rate being applied to properties close to an improved facility or a low rate applied more universally across a city (see, for example, CTS, 2009).

Asset sales – many jurisdictions have reviewed their need to own assets that have provided various public services (e.g. electricity, water, ports, major roads), asset sales and/or Public Private Partnerships (for example) providing an opportunity to free up capital for use in other areas, such as public transport. It was recognised that such opportunities are essentially one-off and that there is a risk of loss of network control in interdependent transport networks if part is 'privatised', a risk against which transport authorities need to guard.

Workshop 6 participants saw much value in the recent Canadian ten year infrastructure funding approach, embedded in the New Building Canada Plan. This long term funding commitment was seen as likely to encourage allied long term thinking about (inter alia) land use/transport integration. It includes $53 billion to build roads, bridges, subways, commuter rail, and other public infrastructure in cooperation with provinces, territories, and municipalities over 10 years, starting in 2014–2015. Making any urban allocations against this Fund dependent on the demonstration of an effective integrated land use/transport strategy for the urban area(s) in question would seem one way to encourage more integrated planning.

At a local level, the Vancouver approach seemed likely to deliver integrated solutions and align well with the planning/funding horizons of the New Building Canada Plan. The Vancouver approach includes ten-year transport plans and associated funding proposals, guided by a longer term (thirty year) integrated Regional Transportation (and land use) Strategy for Metro Vancouver. The Ten Year Plans encompass public transport and major roads under 'base' and 'supplemental' outlooks, with the first three years fully funded and the subsequent seven years indicative. This approach was seen to offer an opportunity to:

- explore more than one future urban (public) transport development pathway (the *Base Plan and Outlook* sets out the strategic initiatives, transportation programs and services that will be delivered by the South Coast British Columbia Transportation Authority, or TransLink, using existing revenue sources. The Supplemental Plan looks at an alternative funding level, usually larger but, in the case of the 2014 Supplemental Plan, smaller);
- detail the respective benefits, costs and funding implications expected to be associated with each alternative; and
- seek community feedback on these alternatives, both in preparation and when they are in the decision process.

This should help to provide a transparent and accountable political decision-taking environment and, in so doing, serve to improve the workings of the democratic process. Workshop 6 participants again agreed with Thredbo 12 Workshop 3A participants that community buy-in is essential for effective policy development and program/project delivery. The nature of relevant consultation will vary throughout the planning and decision-making process but must be a genuine effort to engage and draw ideas from a wide cross-section, not simply providing information about what others have decided is to be done.

For most jurisdictions, this kind of integrated approach to public transport service planning and delivery will require a *fundamental* change of approach, not just fiddling around the edges. It must start at the long term strategic level, not in a short term political cycle, and seek to free itself from immediate funding constraints, giving people the opportunity to choose from more than one future, starting from what is in place today. Change of this magnitude is likely to require political champions to drive the agenda.

5. System design

Workshop discussion included consideration of the broad structure of public transport network that is likely to be best able to meet a wide range of user, and potential user, needs. Small cities tend to be monocentric and may be best able to provide good accessibility via public transport if their urban structure is compact and services are primarily radial. As city size increases, circumferential/cross town movement patterns become increasingly important and urban structure tends towards polycentricity, reflecting locational influences on the knowledge economy. Public transport systems need to reflect and support development of such emergent activity patterns, generally developing in an interconnected web pattern.

The lower the urban density, the lower the expected PT boarding rate per service kilometre, in general terms. It is in such circumstances that community transport services are most commonly provided, to people experiencing particular transport disadvantage. Several papers presented to the Workshop were relevant to this subject and are discussed in the section on Social Dimensions of Service Provision.

More generally, workshop participants found it useful to distinguish between trunk PT services and local services, where the

distinction is most relevant in an urban setting. **Trunk services** are essentially mass transit, mainly intended to move large numbers of people at good speed from their neighbourhood to dense/relatively dense activity centres (in a polycentric city). The community benefits of these services are primarily user benefits, urban agglomeration economies and reduced external costs of car use (e.g. congestion reduction, cleaner air, lower greenhouse gas emissions, a lower road toll, healthier people because of more active travel choices, etc). **Local services** are primarily concerned with moving people around their neighbourhood or activity centres and/or connecting them with trunk services at those times when longer distance travel is required. Social inclusion is a key benefit of local services. Flexible transport services are primarily located at this scale. The Workshop had papers on both trunk and local services.

In times of funding pressure on public transport services, governments sometimes look to focus funding on trunk services rather than local services, based on maximising patronage per service kilometre or similar metric. This shift poses risks in terms of accentuating social exclusion that has a mobility origin. Alternatively, governments may seek to cut back on all route services and channel some extra support to community transport/paratransit services that are narrowly targeted to one or other disadvantaged groups. These issues highlight the economic/financial versus social trade-offs that are increasingly in focus in tough fiscal times.

Mulley & Ho (2013) review the performance of Sydney's new trunk Metrobus services. These are high capacity, high frequency (10 min in peak, 15 min off-peak, 20 min evening and weekend) services that have been added to Sydney's route bus network since 2008, linking key employment and growth areas across the city. They are additional to the pre-existing, more locally oriented bus services. Chinh and Mulley find that Metrobus services increase patronage in fringe urban areas, where starting public transport service levels are low. Given the propensity for lower income groups to live in fringe suburbs of Australian cities, the services are thus likely to promote social inclusion.

Patronage numbers did not generally increase following introduction of Metrobus in inner areas, where the existing public transport networks are denser and service levels higher. In the latter case, substitution between services is more common, whereas fringe areas experienced net patronage growth that was about in proportion to the growth in service kilometres. In discussion of this paper, it was recognised that user benefits from improved services in inner areas (e.g. faster travel times, fewer transfers) may still be significant, even if absolute patronage levels have not increased. The insights in the paper are important for network planning.

Preston et al. (2013) describe the early stages of a process aimed at improving bus services in South Hampshire, a region in which bus patronage levels have generally been in decline, apart from a growth spurt stimulated by national fare concessions for seniors. Focus group research has suggested that services are generally of poor quality (e.g. in terms of frequency, speed and reliability), have high fares and lack integration, resulting in a fragmented network without any focal points (a typical problem in jurisdictions that primarily rely on *competition in the market* for bus service provision). Improvements being implemented are largely of two kinds: (1) technological improvements to improve aspects of customer service (e.g. WiFi; next stop displays, marketing initiatives – the authors note that there is little empirical evidence on which to estimate the likely impact of such initiatives); and (2), service improvements, including the development of key interchange points and bus corridors. Interestingly while non-bus users were sceptical of the likely value of the technological initiatives in stimulating patronage growth, users were more supportive. Both groups supported improvements in frequency, speed, cost and reliability. Thredbo 14 should have the benefit of some results from this project.

Flexible transport systems (FTS) are defined as transport services where one or more of the following aspects of service are not fixed: route, vehicle, schedule, passenger and payment system (Wright, Emele, Fukumoto, Velega, & Nelson, 2013). FTS are of considerable interest in both developed and developing countries at present. In the former case this interest is largely stimulated by a need to improve the economics of public transport service provision in low volume markets, such as in rural or urban fringe locations, with a particular concern about providing service to transport disadvantaged groups, particularly in a context of constrained public service funding. In developing countries, interest is sometimes involved with formalising the informal sector as the need for trunk public transport movement grows. The Workshop had several papers that dealt with aspects of flexible transport systems/demand responsive transport but none dealing with a developing country context (Thredbo 14 needs to pursue more balance in this regard).

Wright et al. (2013) discuss FTS in the UK, Japan and India, noting the growing interest in such approaches and the growing cost/funding pressures with which they are faced. Their paper concentrates on opportunities to apply new technologies in the areas of booking, scheduling and dispatching to reduce FTS costs. The authors recognise that the addition of these functions can add costs to services, noting potential increases in operating (mainly labour) costs of 20–40% in a UK setting. However, they argue that scale economies provide opportunities to minimise the net cost impact in question. Scale might come, in markets like UK and Japan, from a service organisation contracting to multiple clients. In the Indian case, it is more readily available from population numbers.

The paper discusses three areas of technology development that may assist FTS operation: (1) enhanced scheduling and routing algorithms to cope with multiple vehicles and high passenger demand; (2) remote server/cloud computing, which should lower the cost of multiple operators accessing dispatch technology; and (3) a fully automated booking system, to reduce call centre costs. Japanese experience, where tech-savvy young people are an important emerging urban FTS market, is perhaps more promising than UK experience, where FTS is mainly serving older people, who tend to have less access to ICT applications for service booking. Ride sharing phone apps in India are also promising. Wright et al. (2013) also note the interest in volunteer drivers and smaller vehicles as further ways of lowering service costs.

Ryley, Stanley, Enoch, Zanni, and Quddus (2013) examine experience with demand responsive transport in the UK, looking at six possible market niches, to shed light on service economics (regarded as commercial performance in the paper) and social sustainability. They describe demand responsive transport (DRT) as including initiatives such as flexi-route, dial-a-ride and community car and bus schemes, which essentially have characteristics that mirror FTS. The use of DRT in the UK is noted as mainly having a local focus, with passengers being primarily people who are unable to use conventional public transport. Community transport organisations are usually the provider, with funding support.

The six DRT service opportunities assessed in the paper are: a rural hopper service linking a number of rural settlements to a market town; a shopping service serving (normally) a large supermarket; an employment shuttle that provides employees access to a large suburban employment node; an airport access service; a station access service primarily for commuters; and a hospital access service. The hopper service, shopping and hospital access service were found to mainly support a social inclusion role. The services that targeted air/rail passengers and employees were found to have better prospects for commercial success, the main

barrier being competition from the car. Discussion of the paper centred on whether pursuing targeted market niches was likely to deliver better overall outcomes than services that seek to meet several of these market opportunities at the same time. The answer is likely to be local context dependent (e.g. particular characteristics of potential passengers; density; size of the market; capacity of users to pay; etc).

The Workshop also included three papers that were focussed on social sustainability of public transport. The papers touch on aspects of flexible transport service provision but are all considered in the section on Social Sustainability below, in line with their major emphases.

6. Institutional design

The Workshop had three papers in which much of the focus was on institutional design for sustainability. One dealt with institutional design in a partly privatized model of public transport provision (Christensen, 2013, examining Danish rail), another with institutional design in implementation of new technologies to improve environmental performance of public transport (Miles & Potter, 2013) and the third looked at institutional re-design for delivery of low patronage local services (Stanley, Stanley, & Banks, 2013).

Smith, Nash, and Wheat (2011), in their presentation to Workshop 3A at Thredbo 12, reviewed the opening up of passenger rail markets in UK to competition and concluded that the jury was out on whether it had been a success. Christensen (2013) examined the evolution of passenger rail in Denmark, finding a system experiencing considerable turmoil over the past decade or so, consistent with Smith et al.'s conclusion and reminiscent of Gwilliam's (2008) thinking about regulatory cycles in public passenger transport. Christensen looks at modes of governance of Danish passenger rail, exploring three different forms of governance (policy, organisational and market-based) and three key sets of characteristics of each of these modes of governance (focus, primary actors and tools). The paper describes a system that began an evolution, under Ministerial/political oversight, along the New Public Management pathway towards decentralised and privatised market-based service delivery, with an authority as network planner and contract manager where service contracts were required (and a safety regulatory role being performed) and has subsequently done a major about face, back towards centralised political control, re-centralised organisational governance at Ministry level and service delivery by the incumbent public operator (under a more market-based operating model). Various influences on this change of direction are considered, such as the dominant role of the incumbent and changes in political ideology (as governments have changed). Market-based governance only ever played a minor role in terms of overall market share and the whole process of market creation has been shown to be inherently highly political. This is perhaps unsurprising: in the eyes of the public, public transport (rail passenger) services and their quality ultimately seem to be seen as matters of Ministerial responsibility, irrespective of delivery mode. The Danish example shows the complexity of delivering major changes, the importance of getting 'all the (institutional/governance) ducks in a row' if substantive effective change is to be achieved and of the need for real market potential in markets that are to be opened to competition.

Miles and Potter (2013) discuss a demonstration project for hybrid buses in Milton Keynes (UK), where the intention is to achieve emission reductions from urban route bus operation while delivering commercial performance that is competitive with diesel. The paper considers various technical aspects of the project, particularly related to aligning battery performance and cost with the realities of route bus operation. This included, in particular, an emphasis on re-charging at bus layover points, using fast turnaround inductive charging to minimize time losses and reduce battery size and capital costs.

The paper looks at the business model within which the demonstration project is taking place, arguing that a focus on organizational structures is at least as important to a successful project as is resolving the various technical problems that are confronted in delivery of hybrid electric route bus service. The Milton Keynes project is placing considerable emphasis on an organizational structure that manages risk in a way that will maximize likelihood of the project being completed. The trial is managed by 'an enabling company' and includes various technology suppliers, the bus operator (Arriva), the Milton Keynes Council and a power distributor. The enabling company buys the electric buses, installs and maintains the charging infrastructure and leases the vehicles to the bus operator, allowing them to use the charging system within the terms of the vehicle lease. If the electric bus is cheaper to operate than a diesel equivalent, the enabling company makes a profit. If not, the bus operator is protected against a loss, providing confidence to participate in the project. This innovative business model may be just what is needed for a successful trial.

Stanley et al. (2013) report research undertaken in rural and regional Victoria, Australia, looking at ways of providing improved mobility opportunities for groups of people at risk of social exclusion. Some of the social sustainability issues found in that paper are reported in that section of the current paper, governance/institutional issues being summarised here. Their research points to substantial under-used vehicular capacity in the Victorian rural and regional area they studied, capacity which could potentially be used to meet some of the many unmet travel needs in the area. The use of this capacity was held back by various regulatory, institutional, attitudinal and financial barriers. Their paper reported on the recent establishment of a social enterprise business model in the region, to pursue the shared use of available resources and volunteers, pooling of funding opportunities and sharing of transport tasks, to capture lower costs and synergies across the various entities and users/potential users, building on some of the 'big society' thinking of Blond (2010). If successful, this community-led model will devolve many existing State responsibilities for route and community transport services to community level, with some funding support from the State and possibly national governments.

In discussion about governance/institutional design more generally, Workshop participants concluded that:

- this is a massively underexplored area;
- society doesn't work like a model, which underlines the importance of understanding governance/institutional context to drive change;
- change is not *only* about constructing the 'best' economic/legal model;
- nor is it only about the public sector – it involves broad engagement vertically and horizontally; and
- 'trusting partnerships' between private (both market and civil society) and public sector stakeholders at all levels seem likely to be a useful way to advance change.

7. Environmental sustainability

The capacity to deliver personal mobility with a lower environmental footprint than the private car is an important value proposition for public transport. This argument depends substantially on being able to capture a sufficiently large patronage share. Those Workshop papers that discussed the use of technology to

improve patronage levels (particularly in flexible transport systems) and new service designs (such as for Sydney's trunk Metrobus services) are thus also relevant to the question of environmental sustainability. The public transport environmental footprint also depends on public transport services continuing to reduce the environmental impact of every service kilometre provided. In this context, the Workshop included papers that explored the use of hybrid electric vehicles (Miles & Potter, 2013, discussed above) and the use of biofuels to lower air emissions (Cooper, Arioli, & Carrigan, 2013). A further paper examined the way environmental impacts from major transport improvements can be valued, as a way of giving greater focus to the environmental goal in determining need (Ivehammer, 2013).

Cooper et al. (2013) examine emission performance of buses, with a particular focus on fuel and technology combinations that might be effective in Brazil and India. The authors note that most similar studies have concentrated on European or US settings. The use of in-service/real world drive cycle test data reflects the failure of some buses to meet emission standards in operation, which impacts on air quality outcomes. The paper considers various fuels and technologies to identify combinations that are likely to be most effective in the case study areas, with respect to outcomes for four key regulated emissions (CO, THC, NO_x, PM) and CO_2 emissions (which are not regulated at present, although the US National Highway Safety Authority is developing the first GHG emission regulations for heavy-duty engines and vehicles, to start in 2014). Analysis finds that some of the best performing fuel options in Brazil and India are 20% blend Biodiesel with Diesel Particulate Filter and Selective Catalytic Reduction (B20 + DPF + SCR) and Compressed Natural Gas with Three Way Catalyst (CNG + 3WC). Other fuel or technology combinations are also found to provide meaningful results, with CNG fuels and hybrid buses providing significant PM and CO_2 reductions respectively. Local maintenance practices, driving habits and altitude, for example, may nuance outcomes in different locations. The findings show that policies can be tailored to target specific pollutants, if particular regions are confronted with greater difficulties with respect to some pollutants than others.

Enabling environmental (and social) impacts of transport policies and projects, both positive and negative, to receive balanced consideration alongside economic impacts can be assisted if monetary valuation techniques can be applied to those environmental (and social) impacts, acknowledging the many difficulties involved with this process. Ivehammer (2013) explains the development and application of a technique that quantifies loss in locally valuable natural environments and gain in amenity from traffic reduction in terms of equivalent travel time change, as part of the evaluation of a road project that impacts all three elements (the local natural environment, local amenity elsewhere in the area and travel time). The application of a unit monetary value for travel time saved then allows the environmental/amenity impacts in question to be expressed in money terms, so they can be assessed relative to time saved and other monetary impacts with the project in question. The approach is in its early stages but shows promise. To take it beyond the need for specific local survey work each time it is applied, effort would need to focus on standardized ways of measuring local environmental impact on natural areas. Option values also need to be considered.

8. Social sustainability

Thredbo 12 Workshop 3A identified three major policy issues for public transport in low population density advanced economy settings (Stanley & Smith, 2013):

- providing any services at all in a relatively cost-effective manner, because of the low densities and high expectations in terms of service safety standards;
- dealing with risks of social exclusion that can be associated with the lack of an adequate mobility safety net or with mobility options that only provide high fare alternatives (e.g. taxis, particularly in de-regulated markets);
- how to better integrate paratransit/community services with other public type transport services that exist in low density settings.

Papers at Thredbo 13 Workshop 6 picked up on these themes and added further perspectives, in terms of issues such as:

- mainstreaming versus provision of niche transport solutions for transport disadvantaged groups/people;
- attempts to fill major holes that have been associated with deregulation or are seeking to cater for otherwise unmet mobility needs; and
- re-positioning the social sustainability debate at the higher needs/goal achievement level.

Lucas, Bates, Moore, & Carrasco, 2013 argue that the supply of transport services and opportunities for people to be mobile is unequally distributed between different social groups and that this mainly occurs along the lines of traditional social stratifications. Improved understanding of the way that transport policy decisions affect different social groups is a growing policy concern, the answers to which are not much illuminated by mainstream transport models. The authors examine UK National Travel Survey data to find ways in which social criteria might be better incorporated in mainstream modelling approaches to trip generation and trip distance, to better understand the relationship between social disadvantage and revealed travel behaviours in the UK. They find significant correlations between travel behaviour and social disadvantage and that inclusion of variables such as household income, driver's licence and presence of children in a household leads to improved models. Use of dummy variables enabled inclusion of several categories of disadvantaged groups (e.g. single parents, people with mobility difficulties, ethnic minorities) within the modelling framework. The latter variables were most important in relation to less discretionary travel. Extension of the analysis will further explore the extent to which increased trip making is a choice or an obligation of life circumstances. The research forms part of a wider study to improve the use of transport modelling techniques for better understanding the impacts of local transport policy decisions on the social circumstances of low-income and other socially marginalised populations groups.

The Stanley et al. (2013) research in rural/regional Victoria noted above identified that current route and community transport services in the study region leave many travel needs unmet, a situation that is likely to get worse under funding constraints. While some potentially transport disadvantaged groups have some of their transport requirements met (e.g. people with a disability, people in child protection arrangements, older people and people receiving family counselling), there are still many unmet travel needs within such groups. Others were found to be less well catered for, particularly rural youth, and some groups miss out entirely – e.g. people on a low income living away from route services (e.g. problems getting their children to kindergarten) and those not linked in with a welfare service. The paper argued that there is a tacit hierarchy of social worth in the provision of 'community transport services', as reflected in Fig. 2, which is common in many countries, but that all the activities reflected in that figure should be treated as equally deserving of mobility support, particularly because of the

Fig. 2. Tacit hierarchy of trip worth – rural/regional Victoria (Stanley et al. 2013).

demonstrated links between mobility, social capital and well-being summarised in the research. The social enterprise model developed in that study is intended to change the balance in travel needs that are able to be met.

The idea of demand responsive transport targeting niche markets was picked up in the paper by Johansson and Hiselius (2013), who discuss the trial of a children's leisure bus in Lund Sweden. The trial was a partnership between the municipality, groups running leisure activities and a bus operator. Motivation was partly to introduce young children to public transport use for travel to/from an activity that is currently dominated by private vehicle access, with a view to inculcating life practices at an early stage. Equally, however, prior evidence of 44% of primary school children giving up, or refraining from, recreational activities because of transport difficulties adds a social sustainability argument for the case study (Johansson & Siotis, 2009). The study was intended to identify factors likely to maximise prospects for a well-used service. Service design incorporated various qualities thought likely to encourage support by children and their parents/carers, such as a timetable that meets activity timing, drop-off at the activity location, friendly driver, etc, based on market research. The vehicle that was used had completed its route service for the day, which means that the project improves vehicle productivity. The trial resulted in almost half the users being new bus passengers, who were on average two years younger than children on route buses in Lund. Parents/carers were willing to pay a fare that would generate a cost-recovery rate of 16%, which is less than the city route service average (53%) but seems likely to rise if the service were made permanent.

The papers by Ryley et al. (2013) and Johansson and Hiselius (2013) promote the view that demand responsive transport should target niche markets, when operating in relatively low volume catchments. The Stanley et al. (2013) view is quite different, seeking to pursue multiple markets in a synergistic way, under a business model that lowers costs and includes more volunteering (for cost and social inclusion reasons). This divergent set of views should be monitored in coming years, to see where the evidence lies. Wright et al. (2013) also looked for ways to cut costs for such services, with a view to sustaining operations.

Funding pressures and their potential impacts on socially/transport disadvantaged groups were an issue for many of the Workshop papers and in discussion, as illustrated above. Taking a slightly different angle, Sastre, Manzanares, and Muruzabel (2013) explored the impact of a likely move to increase fares for concessionary Spanish public transport users, particularly older persons. This is seen as a likely outcome of increased privatisation of services. They discuss two attitudinal surveys, one undertaken in Seville (where travel is currently free for older concession travellers) and the other in Pamplona (where the comparable fare concession is half). Respondents current travel behaviour was explored and they were questioned about expected responses to fare increases. Implied elasticity values in Seville were −0.15 to −0.35 for fare changes in the range expected but were much higher in Pamplona (−0.9 to −3.3). While the Seville values are similar to conventional wisdom about the elasticity of demand for public transport use, the authors regard the Pamplona values as more valid. If the Pamplona results turn out to be accurate, they portend very substantial risks of increased social exclusion of older public transport users in that city if fare levels rise as a consequence of funding pressures and privatisation.

As noted above, the Workshop's papers on social sustainability were all focussed in developing country settings. A short discussion about developing country issues harked back to discussion in Durban at Thredbo 12, where the major policy issues in relation to the informal sector in South Africa were summarised as (Stanley & Smith, 2013):

- over-supply in the market place – with associated low margins, poor safety outcomes and risks of violence, as operators pursue market share (with some buying out of property rights to tackle this issue);
- lack of enforcement of regulations and of the right to operate;
- misalignment of regulatory functions between levels of government;
- resolving the question of how far policy should go in seeking to integrate the informal sector into 'normal' public transport systems;
- sustaining low fares to support social inclusion.

Thredbo 14 should more proactively seek papers on social sustainability, and other relevant matters, in a developing country context.

9. Guidelines for sustainable public transport

Based on the preceding range of matters, Workshop participants sought to set down some general principles that might assist the achievement of more sustainable public transport. The following ten guideline principles resulted, which should be sharpened at future Thredbo Conferences:

1. Start with what you have got already (not a *deficit* approach)
2. Understand local contexts and *real people*'s needs
3. Identify, empower and *resource* local champions
4. Include *all* the benefits and costs (for users and *non-users*) in policy and project evaluation
5. Work across different sectors to articulate additional benefits
6. Have a strategic rather than individual project focus
7. Do the immediate but have a longer term perspective of where you want to be in 25–30 years
8. Brand new and shiny is not necessarily best
9. Recognise that there are also tensions between the environmental and social agenda (not only with the economic function)
10. Don't expect the market to be your saviour – IT WON'T WORK!

10. Recommendations for research

- Public governance and understanding transport decision-making
- Developing institutional and organizational capabilities for sustainable public transport delivery

- Capturing the full value of environmental and social externalities (positive and negative) and links to quality of life/wellbeing
- Sustainable public transport delivery in situations of unmet and dispersed demand
- The role of technology in promoting and supporting sustainable transport systems and travel behaviours
- Understanding the role of the informal sector within mainstream transport delivery
- Exploring new and effective ways to fund improved public transport.

11. Recommendations for policy

- Mainstreaming public transport within the climate change agenda
- Providing equitable access to public transport as a *key* priority
- Support inclusive processes and governance models for delivering context appropriate solutions
- Get away from the 'big' transport project culture as *the* silver bullet
- Program focus not individual projects
- Focus on outcomes (social, environmental and economic) not just outputs
- More emphasis on small-scale distributed solutions
- Think about the broader environmental agenda as it is affected by public transport (not just climate change)
- Work across different policy silos and across private, public and voluntary sectors is essential!!!

12. Recommendations for Thredbo 14

- Another workshop on the theme of sustainable public transport – there is more work to do
- Focus more on delivering appropriate sustainable public transport solutions in *developing* countries (Latin American venue!!!)
- Rethink the links and tensions between environmental and social sustainability agendas
- Explore the economic benefits of 'socially' focused transport projects
- Seek papers on a wider set of social issues and pursue perspectives from broader disciplines – e.g. governance, health, safety, choice, social networks and post implementation evaluation
- Seek papers on key performance indicators for sustainable public transport delivery

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Workshop 7 Report: Innovative finance for innovative public transport

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ABSTRACT

Workshop 7 discussed the existence of and opportunities for innovative finance to fund innovative public transport in developed and developing economies across the globe. Innovation was seen in the use of existing mechanisms as well as in the use of new approaches to financing both the capital and operational aspects of projects. The 'when and how' of innovative finance and funding highlighted the need to be sensitive to the context, the nature of the actors involved, the beneficiaries and importantly, the allocation of risk between the various parties. Case studies of different experiences emphasised the critical elements of risk and scale in determining the appropriate financing mechanism and the importance of taking the institutional framework and cultural aspects into account when trying to transfer experience across borders. Policy and research recommendations centre on risk and its allocation between parties for a successful outcome, defining and implementing supportive governance regimes and building an evidence base to reduce the risk management aspects of financing innovative projects.

1. Introduction

Responding to the sustainable transport agenda, new public transport infrastructure is seen as important in creating an environment where higher quality public transport encourages choice riders and leads a modal shift away from car use. Aspirations to develop high speed rail to connect urban centres, the development of a new generation of public transport and personal rapid transport are frustrated in this new era of austerity by public funds for public transport investment being in short supply and likely to be remaining so for the foreseeable future.

This workshop examined the scope for innovative financing to deliver innovative transport in this era of austerity and to investigate the way in which such innovation is affected by competition and ownership in land passenger transport. The workshop discussion distinguished carefully between financing and funding of innovative projects, with the former being the mechanism for providing the resources or funding for projects. The nature of the funding requirement was also identified as key with the different nature of capital and operational needs of public transport investments requiring different approaches.

Twenty workshop participants discussed the twelve presented papers which were divided into four key themes as follows:

1. Principles of innovative funding – when and how?
2. New funding for innovation: can it work? Examples in practice
3. Can PPPs be designed to provide funds for innovation?
4. Challenges for innovation in funding

Innovation means something 'new' and a key result, demonstrated by the wide diversity of papers, was that no 'one size fits all' and how important it is to ensure that funding and financing of any project takes care to consider the specificity of the scheme in question. In this context, the workshop identified many innovative aspects of financing.

This report first considers the evidence under the key themes identified above before moving to a synthesis of the discussion which ranged across the themes.

2. The evidence

2.1. Principles of innovative funding – when and how?

Motivated by the question posed by Olsen et al. (2011) as to whether the best selection of public transport schemes emerges from the contemporary Norwegian system of a series of locally raised taxes and national grants, the paper by Olsen and Fearnley

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(2013) provided a framework for examining innovative funding. This paper considered a number of different funding and financing practices around the world in the context of their transferability (to the case study country of Norway) and in terms of barriers to implementation. Broadly speaking, the paper identifies subsidy schemes for operation and investment, different forms of loan for financing and tax-based schemes. Subsidies in Norway were contrasted with the system in Sweden where the national grant system was in proportion to the 'amount' of public transport provided, thus providing a clear link between provision and funding. Hypothecated or earmarked taxes ranging from congestion taxes, road tolls and the French versement payroll tax, were identified as alternative forms of funding as was looking at ways of exploiting land value uplift from the improvements in accessibility provided by new infrastructure. Public Private Partnerships (PPPs) for investments were discussed alongside alternative forms of contracting. However, the central point of this paper was its consideration of the policy transfer issues and the implications for transferability between countries. Good ideas from one country do not transfer without an understanding of the institutional and governance arrangements and the geographic and demographic characteristics of the originating and receiving countries. In particular Olsen and Fearnley (2013) highlighted the role of understanding the inter-group dynamics of the group of actors involved in public transport funding and financing, drawing on the work of Wilson (1980) and Winter (1991). Identifying the benefits of a project and the burden of its financing as being scattered or focused, provided the basis for intense discussion in the workshop, identifying the potential benefits of creating 'policy packages' where the disadvantages of one funding mechanism can be balanced by the strengths of another.

PPPs come in different forms and Crozet (2013) provided a detailed discussion of the use of PPPs and concessions for the rail sector in France and internationally. As innovative finance, PPPs in this sector have failed, sometimes dramatically, almost as if there is a curse on PPPs for railways. The over-estimation of demand (forecast traffic volumes) is often to blame for these failures. Analysing the appropriateness of financing through PPP or concession, the analysis showed how the high political status of rail projects ("the lines must be built, trains must run and the price quality must be acceptable" p.9) leads to an asymmetry of power and risk between politicians and concessionaire holders/PPP consortia which underpinned the difficult history of PPPs in the rail sector, especially when the public sector funding is the funding of last resort.

In the current climate of austerity, Macário (2013) argued that scarcity of resources made it especially important to develop better evaluation of the benefits of new investments to enhance urban mobility. Evaluating investments in terms of their contribution to enhancing accessibility was a fundamental building block of examining the 'worth' of a project. In the discussion of different funding and financing approaches, the paper highlighted the use of cross subsidisation —frowned upon in many economic circles— as a way of addressing social inclusion by linking good accessibility standards as a public service obligation — as an innovative and currently ignored source of funding. The link between accessibility and funding was discussed at length in the workshop and became a recurring theme as will be seen below.

In summary, the 'when and how' of innovative finance and funding highlighted the need to be sensitive to the context, the nature of the actors involved, the beneficiaries and importantly, the allocation of risk between the various parties.

2.2. New funding for innovation: can it work? Examples in practice

Papers in this section covered a wide variety of practical settings of innovative funding. Dale, Frost, Ison, and Warren (2013) presented the case of a workplace parking levy with its revenue hypothecated to the extension of the tram system in Nottingham (UK). Morais, Aragao, Orrico, and de Freitas Dourado (2013) was more of a hypothetical case study to show how value uplift could have provided the funding for the Metropolitan Railway of Brasilia (and other city infrastructure projects) and how care would be needed in balancing the cash flow if this was to be successful. These large scale projects were contrasted with case studies on the funding of a bicycle rental scheme in Spain (Sastre, López, Alvarez, 2013; Sastre, Casanova, Brieba, Figueroa, 2013) and a co-operative car sharing schemes in small cities and rural areas in Austria (Shibayama, Lemmerer, Winder, and Pfaffenbchler, 2013)). In Spain, the short-term rental scheme was designed to complement the public transport network and the PPP provided for the development and operation of the scheme by allowing the concessionaire to add to revenues through the use of the service and the local area for advertising contracts. In contrast, the car sharing scheme in Austria, intended to complement public transport where it was scarce, was organised by the municipality as a semi-public service and the paper showed how this provided financial benefits both to the municipality in terms of savings in subsidy to public transport and to the car users in terms of removing the need for the purchase of an additional car.

Whilst not explicit, the case study examples of this section highlighted the need to take the scale of the project into account. In Nottingham and Brasilia, the innovative funding was for large scale public transport improvements in contrast to Spain and Austria where the scale was local and small. Each of the case studies echoed elements raised in the papers more devoted to principles (Section 2.1) in terms of being sensitive to context, the important role of risk allocation and the need to be aware of the building block of accessibility in driving the need for investment.

2.3. Can PPPs be designed to provide funds for innovation?

PPPs have been the subject of much discussion in the Thredbo series and three papers were presented to this workshop on the practical implementation of PPPs in the transport context. Discussions centred on the implications for the design of a PPP which were identified as fundamental to success. Olyslagers (2013) provided evidence from developing countries to show that a more 'commercial' approach to 'system managing' bus networks created by a partnership between the public and private sectors was more successful than relying on a regulatory framework to make public sector entities behave more like private firms. It was more successful because it provided more equal partnership and a fairer sharing of the risk. Moreover, focussing on the network as a whole allowed the benefits of accessibility and connectivity to be realised. Sastre, López, et al. (2013) and Sastre, Casanova, et al. (2013) provided an ex-ante study of putting in place an intelligent transport system for the Chilean railways, where partnerships between the public and private sectors took different forms at different stages of the project development. The final paper of this theme, and the paper that was presented to the Conference plenary, was about the M4 motorway tolling PPP in Sydney, Australia (Chung and Hensher, 2013). This was one of the early PPPs which was successfully seen through to completion in 2010. It was an 'incomplete' contract in the contractual sense but the paper highlighted how this incompleteness actually gave the flexibility for both sides to negotiate and resolve issues over the term of the contract. Managing the risk was key to this successful outcome as well as the willingness of the respective parties to cooperate in solving the unforseen matters that arose during the lifetime of the concession.

All three papers in this key theme highlighted the role of risk in determining actual or potential success. Important too was the

recognition that incompleteness in contracts may not necessarily be bad and may even be good, provided both partners to the contract are committed to sensible negotiation over incompleteness when the need arises.

2.4. Challenges for innovation in funding

Whilst all themes identified challenges for innovative funding of public transport schemes, as discussed above, the two papers presented in this theme were specifically focussed on challenges per se. Krogstad and Leiren (2013) concentrated on the impact of the recent trend to delegate public transport investments and operations to specially formed, quasi-autonomous agencies that operate at arm's length from the politicians. However, whilst it might be expected to reduce the tension in the funding of public transport investments and operations, the presented case study showed how this may not be the case. The way in which transport touches everyone's everyday life meant that citizens were very vocal about transport issues, which in turn involved the politicians. The supposedly independent agency is then subjected to political constraints. An important lesson that emerged is that governance issues are often ignored but turn out to be so important. Governance issues were also at the core of Bougna and Crozet (2013) in which the emerging reforms in France to reduce transaction costs were presented. The analysis of transaction costs and a comparison between French and German railways performance highlighted similar financial indicators but markedly different productivity performance. The conclusions were that governance issues must match the desired outcome and that in the case of the French railways, focussing on productivity improvements might produce a better outcome since transaction costs formed only a small part of the total costs.

Governance issues appear to be at the heart of the recent research into the challenges of financing, mainly because more tangible issues of funding have had more attention, such as risk or scale of project. Nevertheless, as these papers and the discussion of the workshop showed, governance issues have a very insidious effect on the outcome, and it is an area where transport specialists have relatively less experience.

3. Discussion

Many of the papers involved looking at investments or operational aspects motivated by getting people out of their cars or using cars or schemes designed to be an adjunct to public transport. In this context, the role of accessibility was key, and valuing accessibility was highlighted as essential in capturing the social inclusion aspects of investments and also their competitiveness.

The discussion in the workshop highlighted that 'innovation' and 'success' did not necessarily go hand in hand. Getting the right project was the key to success and this needed to take account of the institutional framework in particular. Municipalities rather than national governments played a role in innovative funding with development of the cycling scheme (Spain) and co-operative car sharing (Austria), and with the workplace parking levy funding new transport infrastructure in Nottingham. Getting the project right also required 'bottom up' input before the design of the project and an understanding of operational issues before designs were completed. Perhaps the most important attribute of the institutional framework that required recognition was the risk loving behaviour of politicians wanting projects to suit political ends leading to a high probability of failure (e.g., the job creation potential of the project; the eventual establishment of infrastructure etc.). The institutional context crucially affects the allocation of responsibilities in the funding process and this was shown to clearly affect outcomes.

Understanding the defining features of finance was a recurring topic arising from the papers. The scale of projects, large versus small, determines the appropriateness of instrument. Considering the number of actors involved, whether scattered or focussed, showed how packages of instruments could be more innovative than the financing of separate projects. Indeed, the bundling of projects would also support the spreading of risk, making combinations of projects even more attractive. The papers and discussions at the workshop highlighted the existence of a private-public continuum and the way in which the most successful of projects had carefully chosen a point on this continuum. And finally, and perhaps the most important point to remember in defining the features of finance is that bad projects do not need innovative finance, they are just bad and should not be done.

The workshop identified a number of important considerations in financing. Policy and decision-making designed to bring public acceptance or make innovations workable can bring sub-optimal solutions; for example, excluding small workplaces from the workplace levy in Nottingham or excluding environmentally friendly cars from a congestion tax. The lesson here is that the measure must point clearly to the purpose of the tax – workplace travel and congestion respectively. The workshop also discussed at some length the transferability of experience from one place to another – transferring successfully required a clear understanding of the impact of different cultures and settings and the need for transparency and clarity. Capacity building in this respect was seen as key to successful transfer of experience as different outcomes can come from the common objectives of improving efficiency or providing economic benefits.

Workshop discussions returned many times to the mechanisms of innovative financing and agreed that innovative use of existing mechanisms was indeed innovative. PPPs were a good case in point where more effective (not necessarily more complete) contract design would be innovative, avoiding the problems of optimism bias and building trust and partnership (as in the Sydney M4 (Chung and Hensher, 2013)) and importantly getting the risk allocation right would be innovations. Nevertheless, there were a number of possible innovative mechanisms that have not been widely tested, even when the empirical evidence suggests that have worked in some cases, such as value capture, parking and space levies, versement taxes.

The most often recurring theme of discussions was the issue of risk. In particular the allocation of risk to the appropriate party, understanding the relationship between risk, costs and incentives and the role of incomplete contracts in providing flexibility to reallocate risk over the life of the financing product. Associated with this was a need to understand the ethics of risk management and the need to account for risk management in the design of competent and empowered authorities as parties to the financing process.

4. Policy recommendations

The principal recommendations were that there should be recognition that existing funding and financing mechanisms can provide good outcomes and are transferable to other countries or cities, provided the contextual, institutional and cultural attributes were well understood. In terms of mechanisms, the workshop discussions highlighted the key aspect of aligning risk allocation and responsibilities, and that better outcomes would be realised if investment projects were evaluated on wider criteria. Extending the criteria from costs and benefits to include the use of accessibility measures and economic and fiscal impact

analysis would create more certainty in understanding the wider impacts of the project and more security for the providers of finance.

5. Research recommendations and themes for Thredbo 14

Four areas of further research were identified by the workshop discussions. First, the role of risk was shown to be the key determinant in whether PPPs were successful or not. Understanding how risk has been allocated in PPPs and the impact of this on the outcome is an important research question. Second, innovation in PPPs is limited by a lack of an evidence base, particularly in relation to risk management, and this makes risk management a bigger element in the financing of innovative projects than projects which are more straightforward. The workshop recommended that research to create a structured database and benchmarking of existing PPPs and the costs and forecasts of projects would provide this evidence base thus reducing the risk management of new projects. Third, whilst it is known that many PPPs fail because of optimism bias in the forecasts faced by those providing finance, there is no evidence base as to why optimism bias occurs – is it inexperience, stupidity, political expediency or a systematic error from some other source?

Finally, the workshop discussions highlighted a need to have a better understanding of the links between the sources of funding and the outcome of infrastructure and operational developments to provide an evidence base on which to build capacity and transfer knowledge across the globe. In this context, an important component is to understand the role of governance and its impact on the success or otherwise of existing projects.

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