MEASURING THE EXTERNAL BENEFITS OF PUBLIC TRANSPORT

A BUS INDUSTRY PERSPECTIVE

CONTENTS

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About the Bus Industry Confederation of Australia

The Bus Industry Confederation (BIC) is the peak national body representing the interests of Australian bus and coach operators and suppliers to the industry. As the primary voice of the bus and coach industry the BIC works with all levels of Government, regulatory authorities, strategic partners, our industry and the community to:

- Encourage investment in public transport infrastructure and services.
- Coordinate and make more effective existing Federal, State and Local Government policies and programs that relate to passenger transport.
- Improve public understanding of the contribution made by the bus and coach industry to Australia's economy, society and environment.
- Ensure that the accessibility and mobility needs of Australians are met, regardless of where they live or their circumstances.
- Ensure that buses and coaches operate safely and effectively.

About this Submission

This submission addresses selected questions raised by the Issues Paper relating to the Review of External Benefits of Public Transport being undertaken by IPART. The BIC's key focus is on the definition of external benefits, the evaluation of multi-modal public transport within a network, the measurement of carbon emissions benefits from public transport and the social inclusion value of bus trips.

Recommendations

1. Social inclusion is included as an external benefit in IPART Analysis. Research presented in this submission indicates that the single biggest external benefit of urban bus services is related to social inclusion.

2. Agglomeration benefits related to rail, bus rapid transit and trunk bus services to activity centres in Sydney are included in IPART analysis.

3. An emphasis is placed on the external benefits of the public transport network as a whole and a comprehensive approach to evaluating the benefits of multi-modal public transport networks is adopted.

4. Development of a methodology of assessing emissions abatement from modal shift (cars to buses and rail) based on existing approaches and data available.

Do you have any concerns about the current approach to using the value of the external benefits of public transport for fare setting purposes?

The following is an excerpt from a soon to be published paper "*Public transport: funding growth in urban route services"* prepared for the Bus Industry Confederation by Professor John Stanley,

"So long as road users are not required to meet the societal costs attributable to their travel choices, than public transport services should not be expected to recover all their costs. IPART in NSW takes a systematic approach to reviewing public transport fare setting, taking into account some of the external benefits of service provision that flow from the absence of a proper system of pricing road use. Thus, for example, in setting fares for metropolitan and outer metropolitan bus services, the NSW Independent Pricing and Regulatory Tribunal adopts the following process (IPART 2013, p. 3):

- Total Efficient costs of the benchmark operator
- Less the efficient cost of providing school services
- Less non-fare revenue
- Equals efficient costs for the benchmark operator
- Less external benefits for the benchmark operator
- Equals revenue requirement
- Less concession fares
- Equals amount to be funded by passengers

The resulting target fare implies a 41% share of costs to be funded by passengers (the target cost-recovery rate).

This 'second best' pricing/fare setting approach has much to commend it, since it recognises the external benefits that bus provides in terms of reduced congestion and environmental costs. However, Stanley and Hensher (2011a) show that the biggest single external benefit of urban bus services is their contribution to social inclusion. This is completely ignored in the IPART analysis, as is agglomeration benefits (largely associated with rail). The IPART approach should be broadened to include social inclusion benefits and agglomeration benefits."

Do you agree with our proposed criteria for deciding whether a benefit should be included in estimating the external benefits of public transport for fare setting purposes?

The BIC broadly agrees with the proposed criteria for deciding whether a benefit should be included with the following exceptions.

It Needs to Be External

Care needs to be taken to ensure that the definition of an external benefit is not too narrow to encapsulate a range of benefits delivered by public transport which bring both individual user and quadruple bottom line (social, economic, environmental and governance) benefits.

The BIC believes a range of social inclusion and opportunity factors related to public transport, which produce both direct and indirect benefits should also be taken into account when setting fares. We address the value of bus trips later in this submission. Appendix A investigates best practice approaches to assessing benefits.

Do you support considering the external benefits of the public transport network as a whole in addition to a mode-by-mode analysis?

The BIC supports a whole of network analysis. With regards to a mode-specific analysis consideration needs to be given to existing multi-modal travel within the Sydney public transport network. Multi-modal travel has been measured in analysis of journey to work data collected in the ABS census (2001, 2006, and 2011).

In defining multi-modality, consideration should be given to all active and public modes of transport and their interrelationships, including walking, cycling, bus, and train journeys.

Appendix B investigates a comprehensive approach to evaluating multi-modal public transport systems and their benefits.

How should we quantify the costs associated with carbon emissions?

The BIC believes there is scope for the development of a methodology of assessing emissions abatement from modal shift (cars to buses and rail) based on existing approaches and data available. This methodology could incorporate the impact that service and fleet improvements to existing public transport networks can have in reducing carbon emissions by both encouraging modal shift to public transport and improving the environmental performance of the vehicle fleet. Appendix C provides further detail on evaluation methodologies identified in research.

The external benefit associated with increased mobility and social inclusion is best addressed through the Government's targeted concession policy. Do you agree?

The BIC disagrees with this proposition. Benefits flowing from social inclusion generated by bus trips include improved health, increased employment participation, a reduced crime rate and lower welfare benefit payments. These flow-on benefits need to be quantified to complete the picture on valuing the benefits of improved mobility as a means of promoting social inclusion.

Research indicates that a person's household income and their trip rate are both significant influences on risk of social exclusion, the relative influence of these two variables can be used to impute the value of an additional trip. The resulting value is between $A19.30 for a person whose household income level is at the average (this value is derived in Stanley (2011).[1]

Appendix D provides an excerpt from a paper prepared by Professor John Stanley, Adjunct Professor and Bus Industry Confederation Senior Research Fellow in Sustainable Land Transport at the Institute of Transport and Logistics Studies, The University of Sydney.

[1] Stanley, J.K., Hensher, D.A., Stanley, J.R., Currie, G., Greene, W.H. and Vella-Brodrick, D. (2011). "*Social Exclusion and the Value of Mobility*", Journal of Transport Economics and Policy, Vol. 45, Part 2, May.

Appendix A: Best Practice in Evaluating Benefits

Litman (2014) has produced a comprehensive Best Practices Guidebook to evaluating the benefits and costs of public transport.[2]

Litman's analysis includes a range of benefits that overlap between direct (user) and indirect (external) benefits as outlined in Table 1 below. Litman posits that conventional cost benefit analysis in transport tends to ignore a range of external benefits or identify them solely as internal benefits to the user.[3]

The BIC urges IPART to consider including benefits accrued to non-users of public transport that come from the operation of public transport systems in determining fares. While these benefits fit generally into the classification of external benefits, special consideration should be given to including factors such as decreased travel time for car users, decreased travel costs for car users, increased social inclusion and agglomeration benefits.

Consideration should also be the geo-political and economic benefit of reduced oil dependence, and some degree of quantification of this benefit can be found in recent Commonwealth Government inquiries into energy security and future fuel supply.

Table 1: Benefits of Public Transport and Capitalisation in Property Values

Benefits	Description	Considered?	Capitalised in Property Values?
User benefits	Increased convenience, speed and comfort to users from transit improvements	Generally only increased speed.	Yes
Congestion reduction	Reduced traffic congestion	Direct, but not indirect	Direct yes, indirect no
Facility cost savings	Reduced road and parking facility costs	Generally not	Direct yes, indirect no
Consumer savings	Reduced consumer transportation costs, including reduced vehicle operating and ownership costs	Operating costs, but not ownership costs	Direct yes, indirect no
Transport diversity	Improved transport options for non-drivers	Sometimes, but nor quantified	Direct yes, indirect no
Road safety	Reduced per capita traffic crash rates	Direct, but not indirect	Direct yes, indirect no
Environmental quality	Reduced pollution emissions and habitat degradation	Direct, but not indirect	Mostly not
Efficient land use	More compact development, reduced sprawl	Sometimes	Some

[2] Litman, T, 2014, *"Evaluating Public Transport Benefits and Costs: A Best Practices Guidebook"*, Victoria Transport Institute.
[3] Ibid.,

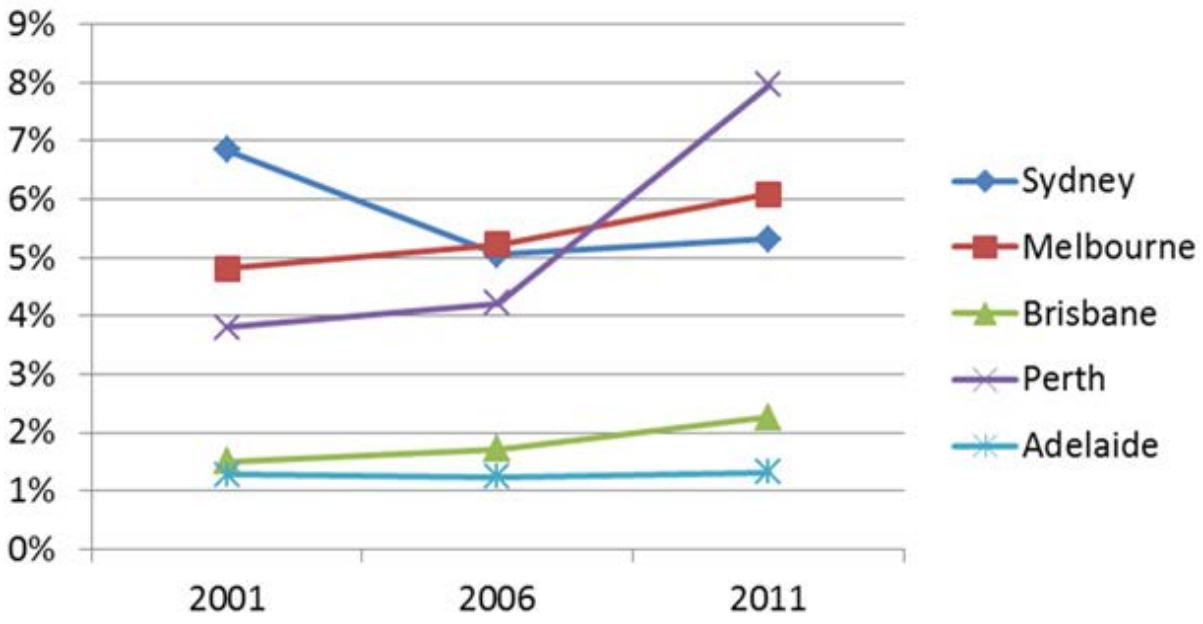
Economic development	Increased productivity and agglomeration efficiencies	Direct, but not indirect	Some
Community cohesion	Positive interactions among people in a community	Generally not	Some
Public health	Increased physical activity (particularly walking)	Generally not	Possibly

Source: Modified from Litman 2014 pp.73

Appendix B: Multi-Modal Analysis

Analysis suggests that multi modal public transport journeys accounts for more than 5% of all journey to work in Sydney. This is outlined in Figure 1.

Figure 1: Multimodal public transport journeys as a share of all journeys to work in city centres



Source: Charting Transport, 2011, http://chartingtransport.com/2013/06/17/how-multi-modal-are-public-transport-journeys-to-work-in-australian-cities/

Further analysis suggests that more than 20 per cent of multi-modal public transport trips to work are to the city centre and slightly less than 20 per cent of multi-modal public transport trips are outside the city centre of Sydney.[4]

Consideration should also be given to the impact that modally specific analysis has on future planning and service delivery in the future. A modally distinct approach to analysis might ignore significant benefits from a multi-modal approach to network planning.

[4] http://chartingtransport.com/2013/06/17/how-multi-modal-are-public-transport-journeys-to-work-in-australian-cities/

The Spatial Network Analysis of Multi-Modal Urban Transport Systems (SNAMUTS) model applied to the Perth – Mandurah rail line has demonstrated tangible, network-wide benefits from the introduction of the rail line including:[5]

- A 32% increase in overall network efficiency, as measured in reduced travel impediment weighted by the number of residents and jobs in the public transport catchment of activity nodes.
- An increase from 21 to 26 (or by 24%) in the number of activity nodes from where a minimum of 250,000 residents or jobs can be accessed within a 30-minute public transport journey.
- An improvement in public transport speed competitiveness compared with road travel across the metropolitan area by 11%.
- A 21% increase in network connectivity at activity nodes.

Litman (2014) outlines a more comprehensive approach to evaluating multi-modal transport systems, problems with existing methods and recommendations for reforms which are outlined in Table 2.[6]

[5] Schuerer, J, 2008, *"Spatial Network Analysis of Multimodal Transport Systems: Developing a Strategic Planning Tool to Assess the Congruence of Movement and Urban Structure"*, Australasian Centre for the Governance and Management of Urban Transport Department of Urban and Regional Planning Curtin University of Technology, Perth.

[6] Litman, T, 2014,*"Towards More Comprehensive and Multi Modal Transport Evaluation"*, Victoria Transport Institute.

Table 2: Reforms for More Comprehensive and Multi Modal Evaluation

Problems With Existing Evaluation Methods	Reforms For More Comprehensive Evaluation
Inadequate data on alternative mode activity and demands.	Collect more comprehensive data on travel activity and demands, particularly for active travel.
Mobility-based analysis which evaluates transport system performance based primarily on motor vehicle travel conditions.	Use accessibility-based analysis which considers various accessibility factors, and therefore potential trade-offs between them.
Often considers a limited set of economic impacts (travel speed, vehicle operating costs, accident and emission rates.	Consider all potentially significant impacts, including indirect impacts, and generally measure impacts per capita rather than per vehicle-mile.
Applies constant travel time unit costs, which fail to account for variations due to different types of trips, and traveler comfort.	Adjust travel time unit costs to reflect variations in demand, and traveler comfort.
Overlooks many impacts of non-automobile modes.	Apply more comprehensive analysis of the benefits and costs of improving alternative modes, increasing use of those modes, reduced automobile travel and more compact land use development.
Evaluates transport system performance using automobile-oriented indicators such as roadway level-of-service and the Travel Time Index.	Use multi-faceted and multi-modal level-of-service indicators which recognize various impacts and various modes.
Ignores equity impacts, including the unfairness of planning that favors motorists over other mode users and fails to provide basic mobility for disadvantaged people.	Use comprehensive evaluation of equity impacts, including horizontal and vertical equity.
Current models are insensitive to many factors that affect travel activity.	Develop and use better models which can more accurately predict how improving modes, pricing reforms and land use changes affect travel activity, and the benefits and costs that result.
Analysis uses exaggerated congestion cost estimates.	Use best practices when calculating congestion costs and congestion reduction benefits.
Ignores generated and induced travel impacts, which tends to exaggerate roadway expansion benefits.	Take into account generated and induced travel impacts when evaluating roadway expansion projects.
Considers a limited set of transport system improvement options consisting primarily of roadway facility expansions and major public transit projects.	Consider a diverse range of transport system improvement options including improvements to alternative modes, demand management strategies and policies that encourage more accessible development.
Planning favors spending resources (money and road space) on roadways, parking facilities and large transit projects, even if alternatives are more cost effective overall.	Apply *least-cost* principles, so resources can be spent on the most cost effective solutions, considering all benefits and costs, including alternative modes and demand management strategies.
Inadequate understanding by decision-makers of evaluation omissions and biases.	Describe to decision-makers any potential evaluation process omissions and biases, and report quantitative analysis results as ranges rather than point values to indicate uncertainty.
Stakeholders are not effectively involved in decision making that will affect them.	Inform and involve people who may be affected by a planning decision.

Source: Litman 2014, pp.18

Appendix C: Evaluation Methodologies for Assessing Carbon Emissions Reductions from Public Transport

There is a range of existing research and data on methodologies for calculating emissions reduction from public transport service improvements and modal shift. This section touches briefly on the literature.

In their research Hook et al (2010) identified the TransMilenio II system in Bogota as the first bus rapid transit system that secured credits for CO2 reduction through the UNFCC Clean Development Mechanism (CDM).

Under their methodology the projected savings of CO2 from 2006 to 2012 on this system were calculated at 1.7M tons. The actual reduction of CO2 emissions was in 2006 60%, in 2007 52% and in 2008 30% of the estimated reduction. The yearly average reduction was 68,000 tons.[7]

This is the most comprehensive analysis of the methodologies available for assessing the emissions reduction impact of Bus Rapid Transit systems and the references used in the research are included in the following footnote.[8]

The methodologies investigated in this research along with research from Todd Litman at the Victoria Transport Institute can serve as useful pathways.

Litman has investigated the emissions reduction value of public transport through research in to the emissions impact of Travel Demand Management strategies (these include Travel Behaviour Change programs highlighted in this submission), analysis of the energy savings and emissions reduction benefits from public transport and research into effective emissions reductions strategies related to mobility.[9]

Litman cites Newman and Kenworthy's (1999) finding that there is a potential for energy savings and emissions reduction impacts from public transport related to factors including the transport impacts of the system, travel conditions, and the type of vehicles used:[10]

- Strategies that shift travel from automobile to transit using existing transit capacity (with minimal increase in transit vehicle-miles) reduce energy consumption and emissions.

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[7] Hook, W et al, 2010, *"Carbon Dioxide Reduction Benefits of Bus Rapid Transit Systems Learning from Bogotá, Colombia; Mexico City, Mexico; and Jakarta"*, Indonesia, Accessed online at: http://www.academia.edu/719566/Carbon_Dioxide_Reduction_Benefits_of_Bus_Rapid_Transit_Systems_Learning_from_Bogota_Colombia_Mexico_City_Mexico_and_Jakarta_Indonesia

[8] Schipper, L., and C. Marie. Transport and CO2 Emissions, World Bank,Washington, D.C. www.cleanairnet.org/lac_en/1415/article-41318.html, 1999.

Schipper, L., M. Cordeiro, and W-S. Ng. Measuring the Carbon Dioxide Impacts of Urban Transport Projects in Developing Countries. WorldResources Institute, Washington, D.C. http://pdf.wri.org/measuring-co2-impacts-transport-projects-developing-countries.pdf, 2007.

Grütter, J. Monitoring Report. CDM Project 0672. BRT Bogotá, Colom-bia: TransMilenio Phase II–IV, Monitoring Period 1/1/2006–12/31/2006,February 6, 2007.

Grütter, J. Project Design Document. BRT Bogotá, Colombia: Trans-Milenio, Phase II–IV, September 6, 2006.

Grütter, J. The CDM in the Transport Sector: Module 5d of Sustain-able Transport: A Sourcebook for Policy Makers in Developing Countries. GTZ, May 2007.

Grütter, J. Monitoring Report. CDM Project 0672. BRT Bogotá, Colom-bia: TransMilenio Phase II–IV, Monitoring Period 1/1/2007–12/31/2007,February 23, 2008.

Grütter, J., and S. Ricaurte. Monitoring Report. CDM Project 0672. BRTBogotá, Colombia: TransMilenio Phase II–IV, Monitoring Period 1/ 1/2008–12/31/2008, February 5, 2009.

Grütter, J. Metrobus Insurgentes, Project Design Document, MexicoCity, July 28, 2006.

Rogers, J. Project Design Document. Insurgentes Bus Rapid TransitPilot Project, Mexico, January 4, 2006.

BRT Metrobus Insurgentes and Eje 4, Mexico. Clean DevelopmentMechanism (CDM-PDD). Version 03, July 28, 2006.

[9] Strompen, F, Litman, T and Bongardt D, 2012, "*Reducing Carbon Emissions Through Transport Demand Management Strategies"*, Federal Ministry for the Environment, Nature Conservation and Nuclear Safety.

[10] Litman, T, 2013, *"Evaluating Public Transport Benefits and Costs"*, Victoria Transport Institute.

- Strategies that improve fuel consumption or reduce emission rates of transit vehicles (for example, retrofitting older diesel buses with cleaner engines or alternative fuels) can provide energy conservation and emission reduction benefits.
- Strategies that reduce the total amount of congested driving (by either reducing vehicle mileage or the amount of congestion) tend to provide particularly large energy conservation and emission reduction benefits.
- Strategies that create more accessible land use patterns, and so reduce per capita vehicle mileage, can provide large energy conservation and emission reduction benefits.

In his work on optimal energy savings and emissions reductions from transport Litman identifies a key issue with the preference for vehicle fuel efficiency programs in that they "ignore the additional external costs that result when increased fuel efficiency stimulates additional vehicle travel, and the additional benefits (besides energy conservation and emission reductions) resulting from travel reductions."[11]

A comprehensive methodology for assessing the emissions reduction value of public transport would need to weigh all co-benefits, potential strategies and encompass policy mechanisms such as Travel Demand Management in assessing the overall potential for low cost emissions abatement from public and active transport.

Appendix D: Social Inclusion Benefits Related to Urban Bus Services

What does this mean in a public transport context? Essentially, it means that, for anyone who is able to undertake a new (or additional) trip because of the availability of new or substantially improved public transport services , the value of that trip is about $A20, if their household income is about average. Thus if a new or substantially improved bus or rail service leads to new trips being undertaken, a value of about $A20 per trip can be ascribed to these new trips in evaluating the case for the improvement.

Economists frequently use the "rule of a half" to value trips that are "generated" by a transport improvement, such as an improved public transport service. Generated trips in this context might be (for example) new trips, trips that are now longer than before, or trips that involve a mode change. These "generated" trips are typically credited with about half the unit benefit that is attributed to trips that were made both before and after a particular improvement.

The $A20 figure is about four times as high as this generated traffic benefit measure if travel by car or public transport had been a prior possibility. It is broadly similar to (in fact a little higher than) the value that would flow from applying the "rule of a half" on the assumption that the option of a taxi was the only available alternative before the improvement. This is consistent with the view that the benefit is associated with a new trip, since taxi travel is expensive and will discourage many people. The resulting value is consistent with the view that a new trip (or activity) is a non-marginal change in someone's activity patterns and that this will have a high value.

Interestingly, the Australian analysis has suggested that the value of an additional trip increases strongly as household income falls. This is not unexpected, because lower income people tend to undertake fewer trips. To the extent that some public transport services are used by lower income households, the value of substantially improving such services is likely to be very high indeed.

Analysts occasionally seek to estimate the value of public transport to society. The "mass transit" argument leads to efforts to quantify the "externality" benefits such as congestion cost savings, greenhouse gas reductions, a lower road toll, cleaner air, etc. To these items should now be added the value of trips that would not be undertaken if public transport services did not exist. This "social transit" value is likely to be very high relative to the other benefit components. A Melbourne application of the values derived above shows the importance of this finding.

[11] Litman, T, 2011, *"Smart Transportation Emissions Reduction Strategies*", Victoria Transport Institute.

The value of public transport in Melbourne (and elsewhere) is essentially about two things:

1. The benefits the system creates for its users, which are largely involved with provision of access to economic and social opportunities and issues that arise therewith; and also

2. How it can reduce the negative externalities that arise from people's travel choices, particularly externalities from car use.

So far as Melbourne's route bus services are concerned, there are six major quantifiable external costs that can be reduced by the operation of an effective urban bus (public transport) service. These are:

1. The costs of traffic congestion;

2. Greenhouse gas emissions, which are implicated in climate change;

3. Local pollution effects (e.g. air, noise);

4. Energy security;

5. Safety and health; and

6. Social exclusion.

Drawing on research by Aftabuzzaman et al. (2009),[12] Stanley (2010)[13] has estimated the externality benefits from Melbourne's route bus services. Aftabuzzaman et al. (2009) reviewed a range of data to estimate how (hypothetical) cessation of public transport services would affect use of other modes. Their analysis suggests:

- increased car use would be the major response to a major cessation/disruption to public transport services, the scale of increase being quite variable but typically 40-60% of the lost public transport patronage;
- some of this increased car use (typically about half) would arise as car passenger trips, some of which involve ride sharing but others would require a chauffeur (i.e. requiring another person to act as a lift giver);
- additional walking and cycling (limited data) can be important;
- cancellation of trips accounts for about one in ten public transport trips..

Conversely, a small survey of the impacts of major outer suburban bus improvements in Melbourne, undertaken by BusVic, has suggested that about half the trips made by bus users in outer urban areas would either:

1. not be made or

2. be undertaken with the assistance of a lift-giver or

3. be undertaken by taxi

If there was no bus service available (Loader and Stanley 2009)[14]. It is argued in Stanley (2010) that each of these three categories of user should be eligible for the value of $A20/trip (at average household income levels, or at a higher unit value of household incomes are less than average).

On the basis of the Aftabuzzaman et al. (2009) research and the BusVic analysis, Stanley (2010) assumed that, if Melbourne's route bus services ceased to exist:

- 50% of bus users would switch to driving themselves or car sharing car (about 40 million additional annual car driver trips assumed).
- A further 20% would take a taxi or be chauffeured, adding another 20 million trips to car use, taking the total proportion switching to car to 70%. This is slightly above the top end of the range reviewed by Aftabuzzaman et al. (2009). This assumption reflects the present author's belief that, because of (1) the lack of alternative public transport choices in many areas of Melbourne where buses operate and (2) relatively

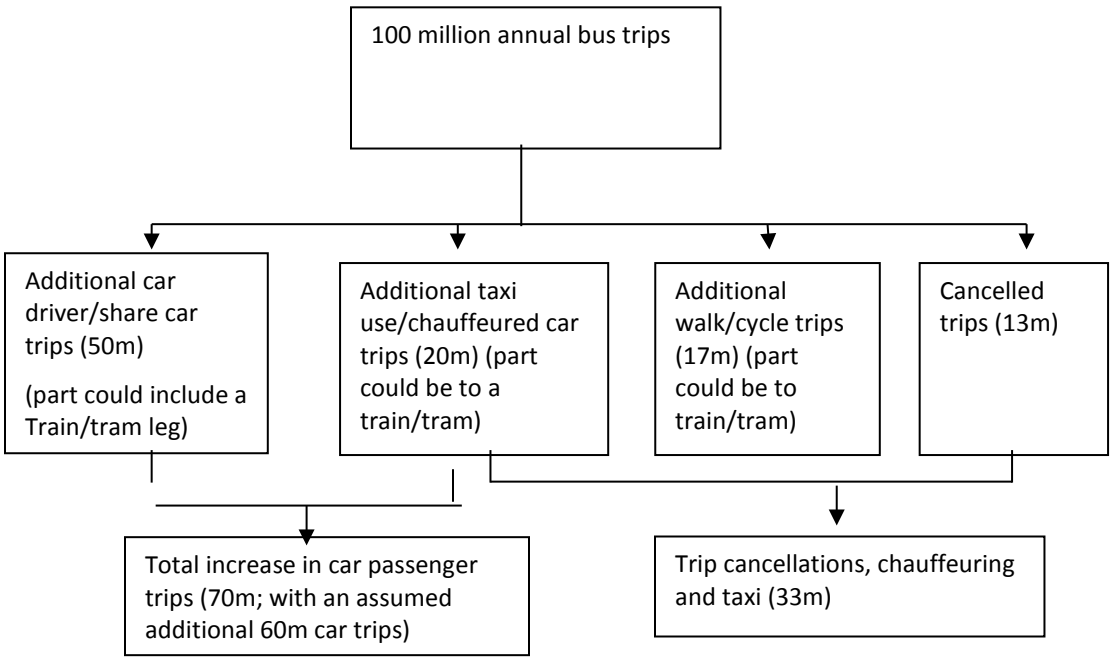
[12] Aftabazzaman, M., Currie, G. and Sarvi. M. (2009). Modeling the spatial impacts of public transport on traffic congestion relief in Melbourne, Paper presented to Transportation Research Board Annual Meeting, November.
[13] Stanley, J. (2010), *"The Value of Melbourne's Route Bus Services*", Report prepared for BusVic, November.

[14] Loader, C. and Stanley, J. (2009). *"Growing bus patronage and addressing transport disadvantage – the Melbourne experience"*, Transport Policy, 16, 106-114.

long trip lengths in these areas, car use will be the main alternative to bus. The chauffeuring proportion recognises the high use of buses by young people, who do not have the option of driving themselves.

- A further 13 million people who were making bus trips would now not travel (cancelling their trip). This takes the proportion in trip categories 1, 2 or 3 above to about one third, which is lower than suggested by BusVic surveys but seems to be broadly consistent with the work reported by Aftabuzzaman et al. (2009). This data is used in the subsequent valuation of social inclusion benefits.
- 17% would walk or cycle. It might be argued that this share could perhaps be higher. However, given the relatively longer average trip distances in areas where bus is the main form of public transport, it is thought to be a reasonable assumption. Figure 2 summarises these assumptions.

Figure 2: Assumed changes in modal splits if Melbourne had no route bus system



Stanley (2010) uses these travel behaviour change assumptions, and draws on the travel time/speed/cost and travel distance estimates from Aftabuzzaman et al. (2009), to derive estimates of how (hypothetical) removal of Melbourne's route bus services would affect congestion costs, local pollution costs, greenhouse gas emissions, energy security, health and safety and social exclusion costs. Table 3 presents the resulting benefit estimates. It shows total benefits at about 3.5 times the gross financial cost to government of service provision (costs being as embodied in gross cost service contracts). As indicated above, these benefits do not include the wider social benefits from reducing risks of social exclusion.

The major single benefit estimated to flow from Melbourne's route bus services is the social inclusion benefit, which was valued at $A767m annually, or 44.4% of total estimated benefits. This benefit estimate was derived using the unit trip values (of about $A20) presented in this paper, increased to allow for bus users average household income levels being below the Melbourne average.

This outcome shows how important the new Australian research is to valuing the benefits from public transport service provision. The second largest benefit was congestion time and cost savings of $A588m, accounting for 34.1% of total benefits.

Table 3: Indicative Annual Value of Melbourne's Route Bus Services

Value of route bus services in *m*etro Melbourne	**$A pa**
Congestion time ($A518m) and fuel ($A70m) benefits	$588 M
GHG ($A7.5m), local pollution ($A12.2m), energy security (A$1.6m)	$21 M
Accidents savings	$15M
Bus user benefits of social inclusion = 33 m trips @ $A23.25 per trip	$767 M
User benefits for other bus users = 67 m trips @ $A5 per trip	$335 M
Total value (externality + user benefits)	**$1.726 B**
Gross financial cost to budget	$486 M
Benefit Cost Ratio (BCR)	**~3.5**