

Department of Premier and Cabinet, Victoria

East West Projects Economic Analysis

**Review of Social, Demographic and Land Use
Analysis**

December 2008

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1 Introduction

Scope

PricewaterhouseCoopers (PwC) has been appointed by the Victorian Government to critique the economic work presented in *Investing in Transport: East West Link Needs Assessment* (EWLNA) report and to provide advice on the further development of the economic analysis conducted for the study.

PwC was requested to “review the full range of economic and community benefits of EWLNA projects and the supporting consultant reports to determine whether there are any critical flaws in the methodology, assumptions, data or analysis underpinning the information in the reports”.

This report reviews the approach for estimating the wider impacts not included in either the traditional CBA, the Wider Economic Benefits (WEBs) analysis, or the impacts connected to retrofitting infrastructure in urban areas. All of which have been subject to separate PwC critiques.¹ This report reviews the analysis of land use, social and demographic impacts in the EWLNA.

These impacts were referred to in the *Investing in Transport: East West Link Needs Assessment* report, but were not included in the overall benefit cost ratio (BCR) for the EWLNA projects. They were sourced from the SGS report *East West Link Needs Study – Social, Demographic and Land Use Analysis* (2008).

The impacts

The impacts considered in the EWLNA seek to account for impacts that are not fully reflected in the ‘traditional’ cost-benefit appraisal.

The impacts included in the SGS report and under consideration here are the “**non-transport / household sector costs and benefits**”:

¹ PwC is considering four aspects of the EWLNA analysis, covering (i) the ‘traditional’ CBA; (ii) Wider Economic Benefits (WEBs); (iii) Impacts connected to retrofitting infrastructure to urban areas; and (iv) Land use, social and demographic impacts.

Table 1 Estimated non-transport / household sector impacts of the East West Link projects

Impact	Impact measure	SGS Description	Present value (\$ million)	% of total costs/ benefits
Benefits	1. Accessibility: increased choice/ access to jobs and services	Measures the increased ability of households to access jobs and services as a result of the East West Link infrastructure projects.	7,928.4	73.3%
	2. Urban amenity: reduced severance	Measures the decreased noise and improvement in visual and pedestrian amenity from the East West Link projects	2,870.6	26.6%
	3. Urban growth: regeneration/ consolidation of urban opportunities	Measures network infrastructure cost savings resulting from provision of dwellings within the established urban area as a result of the East West Link projects (compared to accommodating additional dwellings in a new suburb on the urban fringe).	9.6	0.1%
Total benefits			10,808.7	100%
Costs	1. Urban amenity: loss of access to open space/ parkland	Measures temporary and permanent loss of access to open space and parklands.	21.7	2.70%
	2. Urban amenity: increased severance	Measures the costs of infrastructure projects creating a physical barrier separating communities through increased noise and loss of visual and pedestrian amenity.	782.4	97.28%
	3. Urban growth: stimulus to outward urban growth	Measures additional infrastructure network connection costs incurred by service providers (water, electricity, etc.) for every dwelling that is transferred from the established urban area to the outer fringes.	0.2	0.02%
Total costs			804.3	100%
Total net benefits			10,004.5	
NEW EWLNA BCR (if those benefits were included)			2.0	

Source: SGS 2008, East West Link Needs Study – Social, Demographic and Land Use Analysis, p. 52.

Note: totals may not sum due to rounding

The net 'non-transport / household sector costs and benefits' total \$10.0 billion. They have only been referred to, in a qualitative manner, in the EWLNA Final Report and have not been quantitatively integrated to the BCR because they were seen to be 'cutting edge' and not yet broadly accepted in the 'cost benefit analysis community'².

The benefit and cost profile estimated by Meyrick in the traditional CBA and WEBs resulted in a BCR of 1.4. If the accessibility benefits are accurate and do not represent double-counting of the traditional benefits already quantified, they would considerably increase the BCR, to 2.0.

PwC's approach

This report considers whether there are any substantial flaws in the social, demographic and land use analysis conducted for the EWLNA study team that indicate it should not be included in the East West Link BCR. This is important for two key reasons:

- to ensure that the conclusion of the EWLNA team not to include these impacts remains valid; and
- from a 'whole of government' perspective, if non-transport / household sector costs and benefits are included in one project analysis, they should, ideally, be included in other competing projects to assist comparison.

This report considers three elements of each type of non-transport/household sector cost and its associated benefit:

- **Theory** – we consider and comment on the theoretical arguments *for and against* the economic validity of including each of the impacts, and in particular on the EWLNA projects, outlining the argument for and against, but ultimately reaching a view on the theoretical applicability to Victoria alone;
- **Methodology** - we consider the methodology used by SGS to assess the impacts, and to make a judgement as to whether the methodology accurately assesses the benefits and does not risk significant double counting;
- **Data** – we consider the assumptions and input data used by SGS to assess the costs and benefits in this case, to consider if those assumptions are justified and if the data used is valid.

The report concludes by expressing PwC's independent expert opinion as to whether any factors covered in the analysis are significant enough to be included in the BCR conclusions drawn by the EWLNA team. It deliberately seeks to do so in plain English, so that it is understandable by those without extensive experience in, or understanding of, transport cost-benefit analysis.

It should be noted that the services included in this report do not constitute either an audit in accordance with Australian Auditing

² SGS. 2008, ELWNA Response – Valuation of Household Non Transport Benefits.

Standards or a review in accordance with Australian Auditing Standards applicable to review engagements. This is a top down assessment of principles using sample testing based on a negative assurance basis.

2 Accessibility

2.1 Benefit 1 - Valuation of the benefits of increased access to jobs and services

SGS notes that a lift in a suburb's accessibility compared with other suburbs will improve its capacity to attract and retain households and jobs.

A summary of theory, methodology and data used by SGS in its analysis is contained in Table 2.

Table 2 SGS theory, methodology & data for accessibility benefits

Element	Description
Theory	<p>SGS defines two types of changes in a household's ability to access jobs and services resulting from a major infrastructure development:</p> <ul style="list-style-type: none"> the first change occurs with firms relocating to more accessible locations across the metropolitan area; and the second change occurs when travel time is reduced and the 'job catchment area' within an acceptable travel time of 30 minutes is extended. <p>It is argued that accessibility benefits for households located in the Melbourne area will change land values. Furthermore it is suggested that there will be increased 'opportunity' to access jobs and services and, as such, are additional to the travel time savings calculated in the traditional CBA.</p> <p>Therefore, SGS considers households are prepared to pay a premium in order to strategically locate themselves to access a range of opportunities both now and into the future.</p>
Methodology	<p>A multiple linear regression model was used to estimate the relationship between jobs accessible within 30 minutes and median dwelling values. A separate regression analysis for each of the regions of Melbourne (East, West, North and South) was undertaken.</p> <p>The regression model did not consider inner Melbourne (Melbourne, Port Phillip and Yarra), which were separately estimated to have access to over 1 million jobs within 30 minutes (under the best case scenario).</p> <ul style="list-style-type: none"> Based on results, it was assumed that each job that became accessible would have a positive impact on housing prices.

Element	Description
Data	<p>Regression analysis used:</p> <ul style="list-style-type: none"> • house prices - median dwelling prices for Melbourne's east, west, north and south regions for 1996, 2001 and 2006 sourced from Valuer-General/Landata (Department of Sustainability and Environment); • journey time - travel time matrix for 1996, 2001 and 2006 (provided by Veitch Lister Consulting); and • employment – ABS Census data. <p>This generated an accessibility distribution and an estimate of the number of jobs accessible within 30 minutes as a result of the East West Link projects. This was determined for households in the bottom 3 quintile of the accessibility distribution under the Base Case. This was considered a conservative approach by SGS as it is likely that all households would benefit from improved access to jobs and services.</p> <p>Using the regression results and the total number of households in the relevant Melbourne SLAs, SGS estimated the benefit to Victorian society would represent \$7.9 billion (over the 30 year evaluation period). SGS noted that if the benefits were extended to all households (not only the bottom 3 quintile), this figure would be of \$41 billion.</p>

Source: Meyrick 2008, Transport and the Economy, p.42; SGS 2008, Valuing Household Sector Non-Transport Benefits in Cost Benefit Analysis – East West Link Needs Assessment Response, p.12-15; SGS 2008, East West Link Needs Study – Social, Demographic and Land Use Analysis, p.20-26; & Geurs, K T., Van Wee, B., Accessibility evaluation of land-use and transport strategies: review and research directions, Journal of Transport Geography, volume e12, no 127-140, p. 136.

Discussion

This area of analysis is cutting edge, and takes appraisal techniques into new territory. Transport projects clearly have an impact on dwelling values as accessibility improves, and it is right to seek to capture these impacts.

However, it is considered that inclusion of these benefits through this methodology would result in significant double counting of benefits already included in the conventional CBA and the WEBS, because:

- the value of travel time (VOTT) incorporates into it a capitalisation of increased land values resulting from reduced journey time. Australian Transport Council (ATC) Guidelines state that:
 - increases in land values that may result from transport initiatives are generally a capitalisation of other benefits. Accordingly they should not be included in an economic

appraisal of initiatives because this would double count benefits (ATC Guidelines, Volume 4, p.16); and in addition

- any increases in land value resulting from reduced journey time is a capitalisation of journey/travel time savings – hence land value increases should not be included elsewhere in the appraisal (ATC Guidelines Volume 3, p. 37).
- the WEBs benefit: ‘improved labour productivity and supply’ measures the tax benefit of increased output resulting from those that take up new job opportunities as well as existing workers expanding productivity as a result of the transport development (i.e. those that take up new job opportunities). This is done by estimating:
 - new workers who enter the labour supply due to a reduction of commuting time/costs; and
 - existing workers who work longer hours or shift to more desirable jobs due to a decrease in commuting time/costs.

There is also the potential for additional potential double counting with other SGS social, demographic and land use impacts, including:

- the ‘access to parklands/ open space’ defined elsewhere by SGS took into account the willingness to pay of non-visitors of parklands which overlap as well the willingness to pay of households to be strategically located close to jobs and services; and
- land prices have also been used by SGS to calculate increased/ decreased severance impact.

A number of further, (readily fixable) minor observations are:

- the analysis period used is not aligned with the conventional CBA. It is only 30 years in total in comparison to the 50 years after construction is complete assumed in the Meyrick CBA. It is not clear whether the same construction period was assumed;
- it is not clear if the travel time matrix was assumed to vary over the analysis period – preferably it would be aligned with what was assumed for the conventional CBA traffic modelling;
- 2006 house prices were used, indicating that the prices were not in 2008 dollars in line with the conventional CBA’s base year; and
- SGS does not provide a basis for the 30 minute criteria – in refining the analysis this 30 minute figure could be investigated through empirical research to give greater accuracy.

Key findings

Whilst the impact on dwelling prices is unarguable, the issue remains the degree of double counting with traditional economic appraisal. Our view is that there is likely to be significant overlap, which calls in to question the validity of inclusion on the CBA. Therefore, it would be valuable to conduct further work to develop an evidence base and a methodology that could accurately strip out the impact on dwelling prices that was not

already captured in the value of travel time and other impacts assessed elsewhere in the SGS report.

Therefore, at this stage, we suggest that the 'increased access to jobs and services' should not be included in standard CBA, due to the potential for double-counting or overstatement vis-à-vis the benefits already quantified within the CBA including:

- *travel time savings;*
- *the 'improved labour productivity and supply' WEB, and*
- *other benefits (e.g. access to open space and severance effects).*

3 Urban amenity

3.1 Benefit 2 and cost 2: Valuation of the benefits and costs of severance effects

Severance is defined as the degree to which infrastructure and transport services act as a physical barrier to non-users of these facilities to access people and services elsewhere in the community.

It is suggested that severance benefits, as well as costs, are expected to occur as a result of the East West Link projects, including:

- **Benefits** –severance benefits are expected to mainly result from the proposed ban of heavy commercial traffic under the ‘truck action plan’ in Yarraville and Footscray. The new or upgraded road infrastructure would accommodate heavy vehicles and eliminates their use of residential streets, reducing severance in residential areas. According to SGS, traffic volumes on local roads both to the north and south of the tunnel link are expected to decline significantly as a result of the East West Link projects. Generally, the new infrastructure is expected to engender significant decline of traffic volumes on many parts of Melbourne’s residential road network; and
- **Costs** – increased severance is estimated by SGS to mainly result from the eastern tunnel works which will use a “cut and cover” method involving
 - surface road works including new lanes; and
 - constructed pedestrian walkways exposed to busy main roads.

Moreover, SGS suggest that the proposed elevated road structure would affect industrial and residential areas through:

- visual dis-amenity;
- increased noise; and
- acquisition of existing dwellings.

SGS valued increased severance and loss of residential amenity at \$782 million (NPV over the 30 year evaluation period).

A summary of theory, methodology and data used by SGS in its analysis is contained in Table 3.

Table 3 SGS theory, methodology & data for severance impacts

Element	Description
Theory	<p>The following severance impacts are identified as likely to occur as a result of the East West link projects:</p> <ul style="list-style-type: none"> • noise impacts (decreasing or increasing);

Element	Description
	<ul style="list-style-type: none"> • visual effects (improvement or dis-amenity); • pedestrian (improvement or dis-amenity); and • community cohesion effects (positive or negative). <p>And it is considered that these impacts on urban amenity should be valued and included in the CBA.</p>
Methodology	<p>In order to estimate the monetised value of East West Link severance impacts, SGS first defined two broad catchment areas: the eastern region that is predominantly residential; and the western region that comprises both residential and industrial centres.</p> <p>Based on these areas, SGS estimated the current aggregate market value of all residential properties (existing or planned) impacted, by type of impact, under each of the 3 proposed options located within 0-100, 100-200, 200-500 meters of the proposed infrastructure.</p> <p>From the aggregate market value, SGS estimated effects on the property values from severance impacts using the following methodology:</p> <ul style="list-style-type: none"> • noise effects – SGS sought advice from Maunsell’s Bassett Acoustics to analyse the noise effects from the East West Link projects (which concluded that unless car traffic volumes are at a minimum doubled or halved, and heavy commercial traffic is increased or declined by at least one third, then additional noise amenity impacts would be unlikely; and • noise, visual amenity, pedestrian amenity and community cohesion – in order to estimate the impact of market value from severance impacts including: visual amenity, pedestrian amenity and community cohesion, SGS applied Charter Keck Cramer (CKC) recommended discount/uplift factors to property values in order to reflect dis-amenity/amenity effects.
Data	<p>The following data was used to estimate severance impacts:</p> <ul style="list-style-type: none"> • 2007 median residential property values from the Valuer-General/ Landata, Department of Sustainability and Environment used to estimate aggregate market values of residential properties by suburb; • discount / inflation factors for application to the residential property values were sourced from CKC.

Source: East West Link Needs Study – SGS - Social, Demographic and Land Use Analysis, pp. 29-46 and Australian Transport Council (ATC) 2006, National Guidelines for Transport System Management in Australia, Volumes 3, p.41-47 and p.56.

Discussion

Severance is well recognised as an externality generated by transport infrastructure projects. Noise and visual effects are routinely monetised in traditional CBA. Some countries have already implemented a framework to assess 'severance' effects in transport appraisals such as Sweden, Denmark, Germany, New-Zealand and the United States.³

To date in Australia, impacts on severance have not generally been monetised for inclusion in transport appraisals, except where it may be captured in other impacts such as noise externality costs. The ATC National Guidelines on transport appraisal state that urban amenity impacts in general tend not to be monetised in Australian appraisals, because, in the main, it is too difficult or expensive to produce reasonable estimates (see Volume 3, p.53).

Therefore 'severance' is recognised as a genuine cost or benefit for inclusion in the conventional CBA, as long as the approach is robust and avoids double counting. Therefore SGS is right to seek to capture this impact.

The approach used to monetise severance impacts does not provide a direct linkage between the physical impacts of noise, visual, pedestrian and community cohesion effects on the change in property values.

Nevertheless, our view is that the change in property values may be an appropriate method of assessing the costs or benefits (e.g. hedonic pricing). However, the approach available to SGS for the purposes of the Study does not appear to be as robust or detailed as comparable hedonic pricing methods.

In particular, the analysis would benefit from greater detail in relation to:

- the methodology used to determine CKC discount and uplift factors, which would allow an assessment of the validity of the methodology to decrease/increase property values;
- the impact of dwelling demolition on aggregate market values. This could potentially be included for completeness; and
- the traffic forecasts used to determine the level of noise expected. It is not clear whether the Veitch Lister model was applied to this approach, which would align it more closely with the conventional CBA.

(It is also noted that separation impacts were valued over a 30 year appraisal period. This is not aligned with the period used in the conventional analysis, but could be readable addressed.)

Key findings

Increased severance and loss of amenity were not included in the main CBA, but are important impacts that should be assessed. It has previously been recommended by PwC that the EWLNA team consider accounting for many of the community externality impacts in the main CBA (noise; nature and landscape; and urban separation are defined in

³ UK Department for Transport, Monetisation of severance impacts, pp.4-5.

the ATC Guidelines as well as within the RTA Economic Appraisal Manual).

Further work to enhance confidence on accuracy would be desirable before the severance impacts calculated by SGS could be included in the conventional CBA. For example, a more detailed willingness to pay / hedonic pricing methodology would offer a greater degree of accuracy. However, if this work is undertaken, particular attention would need to be taken to ensure overstatement was avoided, as noise, nature and landscape, and urban impacts, following the PwC recommendations, are likely to be quantified in updates to the conventional CBA.

3.2 Cost 1 - Valuation of the costs of loss of access to open space/ parklands

Four parks could be affected by road and rail tunnelling for the East West Link projects, including: JJ Holland Park, Royal Park, Spotswood Oval and Newells Paddock Wetlands Park.

It has been assumed that temporary loss of access to parklands will occur within the construction phase, and then access to some parkland will be permanently lost after completion of construction.

The parklands' amenity impacts were estimated to be \$21.7 million (NPV).

The theory applied by the EWLNA team to value the cost of losing access to open space and parklands, as well as the methodology employed and data used are detailed in Table 6, along with PwC's analysis.

A summary of theory, methodology and data used by SGS in its analysis is contained in Table 4.

Table 4 SGS theory, methodology & data for costs of losing access to open space/parklands

Element	Description
Theory	<p>That the infrastructure projects will engender a loss of access to open space and parklands and this comes at a cost to the community. Two types of impacts were defined:</p> <ul style="list-style-type: none"> • <i>temporary loss of parkland sections</i> – for example through the location of a temporary tunnel evacuation site during construction; and • <i>permanent loss of sections of parklands</i> – for example resulting from land requirements for the developments.
Methodology	<p>Three parameters are used to define the changes in value of the parkland to the community:</p> <ol style="list-style-type: none"> 1- estimated annual parkland visitations; 2- the price visitors will to pay to use the parks; and 3- the price non-visitors will to pay based on the assumption that people are often willing to pay for arts, culture, heritage and parkland facilities even if they are not the direct users (SGS cites a number of theoreticians underlying this price). <p>Moreover, it is assumed that:</p> <ul style="list-style-type: none"> • the construction phase impact on parkland will occur in line with the construction timing; and

Element	Description
	<ul style="list-style-type: none"> permanent impacts will accrue every year upon completion of construction and will remain constant over the remainder of the analysis period. <p>Due to incomplete available data on current visitation to the relevant parks, SGS used a model developed by Zanon (1998) for Parks Victoria. The formula includes:</p> <ul style="list-style-type: none"> a service standard parameter based on 17 park attributes that are important to visitors; a catchment population defining the population which lives within a 15 minute drive of the parkland; and an awareness criteria which is based on how well known the parklands are to the community. <p>SGS notes that the results of a study undertaken in 1999 by Read Sturgess & Associates study indicate that total willingness to pay for a park visit was \$21.00. Based on this, SGS applied a standard \$10/hour willingness to pay factor, based on an average 2 hour visit. SGS doubled the benefit enjoyed by users to take into account the willingness to pay of non-users.</p>
Data	<p>Input data to estimated park visitation includes: service standard attributes, catchment population, and awareness criteria. SGS does not provide significant detail in its report on the input data used to determine the expected annual parkland visitations.</p>

Source: East West Link Needs Study – SGS - Social, Demographic and Land Use Analysis, p.41. and Australian Transport Council (ATC) 2006, National Guidelines for Transport System Management in Australia, volume 3, page 101.

Discussion

There have been economic analyses conducted on the value of open space in Australia (e.g. 2003 Lansdell & Gangadharan), comparing travel cost models and the precision of their consumer surplus estimates, (University of Adelaide and Flinders University of South Australia), and therefore there are strong economic theory foundations for SGS seeking to account for loss of open space.

The existence of an additional cost incurred by the loss of access to parklands is recognised and there is an economic value of access to parkland and access to space that merits consideration.

It is considered that the robustness of the SGS analysis could be further improved through providing a greater basis for:

- the use of the willingness to pay figure, and in particular the use of the \$10/hr value;

- doubling the benefits for users to take into account non-users benefits;
- using an estimate of 'willingness to pay to access parkland' as opposed to 'willingness to accept compensation for losing access to parkland';
- why the visitation model is considered applicable to the four parks affected;
- the assumption that users and non-users would place the same value to accept compensation not to access (intuitively it would be lower for non-users); and
- the assumption of a 2 hour visit length.

There is also a double counting issue. As land purchase costs were included in the project capital costs, the value of parkland would be double counted if the SGS park loss costs are also included. The opportunity cost of land should be the present value of future benefits from the parklands. Whilst the land purchase cost is likely to be undervalued, it would not be valid to include both operating costs willingness to pay values until further work had accurately identified the scale of the undervaluation.

(Again the analysis period assumed by SGS is not aligned with the conventional CBA, a point which is readily fixable).

Key finding

Access to parklands and open space, in general, has an economic value. Whilst some potential improvements to the accuracy of the assessment are suggested above, there is a strong case for the inclusion of such costs in conventional appraisal.

The key refinement would be to update the 1999 Study to develop an up to date figure for the willingness to pay to visit parkland areas, and to provide greater certainty as to the value non visitors put on the parkland.

In addition, given that PwC understands the conventional CBA captures land purchase costs as a capital cost, the additional value of loss of parklands is likely to result in significant double counting (assuming that the capital costs are based on the value of land as parkland). The assessment would therefore be improved by further work to identify the degree of undervaluation, so that the risk of overstatement of benefits is minimised.

4 Urban growth

4.1 Benefit 3 and cost 3 - Valuation of the benefits from creation of regeneration or urban consolidation opportunities and costs of outward growth

It is considered that the following impacts of urban growth are likely to occur as a result of the East West Link projects:

- *benefits from creation of regeneration or urban consolidation opportunities* – Regeneration sites represent opportunities for mixed use development such as residential and retail uses, and
- *costs of outward growth* – Changes in urban structure related to the location of households.

A summary of theory, methodology and data used by SGS in its analysis is contained in Table 6.

Table 5 SGS theory, methodology & data for urban growth costs and benefits

Element	Description
Theory	<p>It is considered that:</p> <ul style="list-style-type: none"> • additional infrastructure network ‘connection’ costs are incurred by the service providers (water, electricity, etc.) for every dwelling that is transferred from the established urban area to the outer fringes; and conversely that • the provision of dwellings within the established urban area leads to significant network infrastructure ‘cost’ savings. <p>Factors expected to influence the accessibility of a given area are defined as:</p> <ul style="list-style-type: none"> • reduction/increase of severance effects; • improvement/degradation of local amenity; • opportunity to amalgamate small vacant/or not fully utilised sites; and • improved access to public transport infrastructure. <p>SGS cites existing literature on cost savings delivered by urban consolidation considering that Birrell (1991) and Hughes Trueman Lundlow et al. (1991) are of most importance to the Melbourne case.</p>
Methodology	<p>The methodology distinguishes between dwellings located at the urban fringe with:</p>

Element	Description
	<ul style="list-style-type: none"> • pre-existing infrastructure and contiguous urban development; from those with • no existing infrastructure and non-contiguous urban development. <p>Based on these two dwelling types, SGS considered infrastructure ‘connection’ costs including road provision, water and sewerage, telecommunications, electricity, gas, public transport and public open space (this last one has not been quantified).</p> <p>SGS also considered the savings in ‘connection costs’ that new dwellings would be expected to receive if they moved to the urban fringe affected by the East West Link projects.</p>
Data	<p>The data used by SGS to estimate urban growth costs included:</p> <ul style="list-style-type: none"> • <i>connection costs per dwelling</i> – based on available literature, SGS estimated that connection costs vary from \$8,000 to \$50,000 and assuming that each additional dwelling that needs to be accommodated in the outer fringe of Melbourne due to change in the accessibility contours will cost (net) \$20,000 in infrastructure ‘connection’; • <i>number of additional households</i> – SGS estimated that changes in urban structure would remain largely neutral with just 25 additional households that would locate in Melbourne’s fringe compared to the Base Case; and • the resulting cost of outward growth was estimated by SGS at \$0.2 million. <p>The data used by SGS to estimate urban growth benefits included:</p> <ul style="list-style-type: none"> • <i>net cost savings per dwelling</i> – regarding the savings in ‘connection costs’, SGS estimated each dwelling would result in a net cost savings of \$23,400; and <p><i>estimated number of dwellings in each site</i> – by multiplying this figure by the estimated number of dwellings in each of the identified regeneration/ urban consolidation sites, SGS estimated that cost savings of \$9.6 million (NPV) would be delivered.</p>

Source: SGS 2008, *East West Link Needs Study - Social, Demographic and Land Use Analysis*, p.35 and 46.

Discussion

In conducting a CBA it is important to ring fence what is being analysed in order to only include direct impacts and externalities. Impacts included in a transport CBA must be directly attributable to the project. Impacts on additional dwellings⁴/ land use could be considered indirect impacts, and so on a theoretical level, urban growth should not be accounted for in transport appraisal given it is an indirect effect of the East West Link project. As such, the inclusion of these impacts is not widely accepted.

However, if land use change is one of the objectives of the East West Link projects, under that circumstance there would be a clear basis for the Victorian Government to consider land use costs/ benefits. If so, given that indirect land use changes are not widely accepted as part of the cost-CBA process, then a presentation of this information alongside the traditional BCR information, either in quantitative or qualitative form, would be an alternative approach to discuss the associated impacts of urban growth.

Looking more specifically at the SGS methodology, it is noted that some of the road provision costs included in the estimate of 'connection' costs have already been quantified as a capital cost in the traditional CBA.

Further refinements would also be possible with further work to tighten the methodology used to estimate the number of additional dwellings, and the basis for the \$23,400 in connection cost savings per dwelling.

Key finding

As the inclusion of regeneration or urban consolidation benefits is yet to be widely accepted, urban growth costs and benefits should not, at this stage, be added to the overall BCR of the East West Link projects. An alternative approach may be to include a qualitative coverage of these impacts alongside the CBA.

⁴ SGS estimated that changes in urban structure would remain largely neutral with just 25 additional households that would locate in Melbourne's fringe compared to the Base Case.

5 Proposed refinements

A summary of PwC's key findings relating to the inclusion and estimation of marginal benefits in the EWLNA BCR is presented in Table 8.

Overall, the scale of the SGS social, demographic and land use impacts (\$10.8 billion of benefits and \$0.8 billion of costs) appears high. If accurate, the social, demographic and land use benefits are 75% of the benefit captured in the conventional CBA & WEBS analysis. Hence if these benefits are realistic/genuine it implies the current methodology for transport CBAs sizably understates total benefits. Given the detailed work behind the theory and application of transport CBAs to date, PwC notes that significant supporting evidence would be required to justify that these conventional frameworks underestimate impacts by so much.

The proposed refinements below aim to lead to more robust CBA results through a more accurate methodology. In summary PwC recommends that the SGS estimates for social, demographic and land use impacts not to be included in the overall BCR of the East West Link projects. While there is economic merit in understanding these impacts, in most instances their inclusion could result in the double counting or overstatement of benefits, or alternatively could result in inclusion of indirect benefits beyond those generated specifically by the project. As a result, the BCR presented in the EWLNA report will not be affected by the proposed refinements at table 6.

Table 6 Summary of proposed refinements for non transport /household benefits included in the EWLNA report

Benefit type	No.	Proposed refinements
Accessibility benefit (Benefit #1)	Proposed refinement #1	The 'increased access to jobs and services' should not be included in standard CBA, due to the potential for double-counting with the travel time savings, the 'improved labour productivity and supply' WEB, and potential double-counting with other SGS impacts (access to open space and severance effects).
Urban amenity impacts (severance) (Benefit #2 & Cost #2)	Proposed refinement #2	Further work would be desirable before the severance impacts calculated by SGS could be included in the conventional CBA. For example, a more detailed willingness to pay / hedonic pricing methodology would offer a greater degree of accuracy.
	Proposed refinement #3	If this work is undertaken, particular attention would need to be taken to ensure double counting was avoided, as noise, nature and landscape, and urban impacts may, following the PwC recommendations, already have been captured in the conventional CBA.
Urban amenity impacts (loss of access to parklands) (Cost #1)	Proposed refinement #4	Given that PwC understands the conventional CBA captures land purchase costs as a capital cost, the additional value of loss of parklands is likely to result in significant double counting (assuming that the capital costs are based on the value of land as parkland). The assessment would therefore be improved by further work to identify the degree of undervaluation, so that the risk of double counting is minimised.
Urban growth impacts (Benefit #3 & Cost #3)	Proposed refinement #5	As the inclusion of net urban growth benefits is yet to be widely accepted, urban growth costs and benefits should not be added to the overall BCR of the East West Link projects. An alternative approach may be to include a qualitative coverage of these impacts alongside the CBA.