New South Wales Government

Department of Premier and Cabinet

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14 NOV 2008

Michael Deegan
Infrastructure Coordinator
Infrastructure Australia
Level 21, Deutsche Bank Building
126 Phillip Street
**SYDNEY NSW 2000**

Dear Mr Deegan

**NSW Submission to Infrastructure Australia**

As outlined in the NSW Government submission to Infrastructure Australia on 31 October, 2008, supplementary information would be provided on the CBD Metro, West Metro and M5 expansion projects.

I am now pleased to provide Infrastructure Australia with the additional information.

If you require any further information or assistance relating to the NSW Government submission please do not hesitate to contact me.

Yours sincerely

P. Duncan

**Peter Duncan**
A/ Deputy Director General

# Outline of *Infrastructure Australia's* Prioritisation Methodology

## Appendix E template

# Appendix E – Summary of Initiative Appraisal - Key Results and Assumptions

## Part A - Overview

Title of Initiative – Sydney CBD Metro

Stakeholder –

NSW Ministry of Transport
ABN 25 765 807 817

Contact –
Mr Rodd Staples
Director
Centre for Transport Planning & Product Development
(ph) 02 9268 2218
(fax) 02 9268 2208
(email) Rodd.Staples@transport.nsw.gov.au

227 Elizabeth Street
Sydney, NSW, 2000

Summary of submission –
The CBD Metro is a new rail line with high frequency, rapid train services within Sydney's central area. The project plans for six new sub surface stations running from Central to Rozelle, providing direct connections between the major centres of economic activity in the Sydney CBD. The project will provide relief to overcrowded CBD stations and also provide significant congestion relief to the broader CityRail network.

Given Sydney's status as Australia's only global city, supporting accessibility to the CBD is of critical importance in maintaining this status. The CBD is the dominant business hub within Australia for international companies especially Asia Pacific finance and insurance operations. According to the City of Sydney[1], the City currently generates $70 billion of value added per year and accounts for 9% of economy GDP.

The CBD currently supports 300,000 jobs and if the targets of the Metropolitan Strategy are to be met this figure will need to increase by 75,000 by 2031. These new jobs will be in the service sector and a significant tranche of these, some 20,000 will be located at the new Barangaroo site to the north of Darling Harbour. The CBD Metro will provide additional transport linkages to this site via the new Barangaroo-Wynyard station. A potential new White Bay station will unlock further development sites and allow the CBD Metro to develop further westwards in the future.

Critically, the project is also a network enabler and facilitates the development of a future metro network with extension projects to the west, the north-west and the north/south-east. This appendix is focussed on the CBD Metro.

The project is estimated to cost $4.822 billion (including land purchase, risk and contingency) with construction from 2010 to 2016.

[1] City of Sydney 2030 Plan
[2] National Guidelines to Transport System Management in Australia, Australian Transport Council, 2006

# Appendix E – Summary of Initiative Appraisal - Key Results and Assumptions

## *Part B – Cost Benefit Analysis (CBA) – Monetised Benefits and Costs*

B.1 Key Assumptions

| *Item* | *Assumption* |
|---|---|
| Key drivers | The key drivers for the CBD Metro project are:<br>• requirement for additional public transport capacity in Sydney;<br>• facilitating residential and business development;<br>• supporting employment growth in the CBD which is a key driver of national economic performance;<br>• congestion into and within the Sydney CBD (all modes);<br>• ongoing growth in population and employment; and<br>• congestion related impacts on economic development.<br><br>The CBD is the dominant business hub within Australia for international companies especially Asia Pacific finance and insurance operations.<br><br>According to the City of Sydney[3], the City currently generates $70 billion of value added per year and accounts for 9% of economy GDP. In addition, the central area contains 40% of the headquarters of Australia's top 500 companies as well being the location for 50% of Australia's export oriented advanced business services jobs.<br><br>The CBD currently supports 300,000 jobs and a further 75,000 are expected by 2031. These new jobs will be in the service sector and a significant tranche of these, some 20,000 will be located at the new Barangaroo site to the north of Darling Harbour. The CBD Metro will provide additional transport linkages to this site via the new Barangaroo-Wynyard station.<br><br>The NSW Government has developed strategic plans metropolitan Sydney that will have a direct bearing on the future development of and prosperity of the CBD. These plans address the Goals published by Infrastructure Australia.<br><br>**The Metropolitan Strategy, City of Cities (December 2005)**: this plan sets the framework for planning in Sydney to 2031. It sets strategic directions for government decisions on the timing and location of investment in |

[3] City of Sydney 2030 Plan

transport and other infrastructure with a view to delivering the best possible services to the community and business across Sydney.

The Strategy seeks to increase employment opportunities and sets out employment planning capacity targets. The Strategy focuses on the need for a more sustainable transport system for Sydney. The specific targets are:

- B2.1.1 Encourage greater housing density in centres where capacity fro employment and civic roles is provided;
- B4.2.1 Carry out transport planning and align investment in rail and bus corridors to support the concentration of employment in centres;
- C1.3.1 Provide 60-70% of new housing in existing urban areas;
- C2.1.1 Identify locations for additional housing; and
- C3.1.1 Identify local centres for renewal through the subregional planning process.

A CBD Metro will assist in achieving these targets by providing greater accessibility to the CBD by public transport and supporting the growth in high value employment, triggering urban renewal and maintaining Sydney's position as a global city. Without this investment the future employment growth of the CBD will be lower which will result in lower GDP growth across the whole economy.

The development of a *State Plan* for NSW was announced by the Premier in June 2006. The Plan identified improvements to transport as a key community goal: These improvements included:

- Increasing peak hour patronage on a safe and reliable public transport system (Priority S6);
- Improving the efficiency of the road network (Priority E7);
- Cleaner air and progress on greenhouse gas reductions (Priority E3); and
- Maintain and invest in infrastructure (Priority P2).

A metro for Sydney will help achieve *State Plan* priorities through increasing public transport capacity, alleviating road based congestion, complement land-use strategies as well as creating the environment for improved urban outcomes.

The *Urban Transport Statement* was released by the Premier in November 2006. It "outlines the potential for metro-style mass transit systems which in the long term may have the capacity to cater for Sydney's ongoing growth as a global city into the second quarter of the 21st Century"

The *Urban Transport Statement* also clearly states that

| | |
|---|---|
| | Sydney's transport system will not be improved through looking at one mode in isolation – it will take an integrated approach which considers the needs of passengers throughout the Sydney region. |
| Base case | To be included once final modelling analysis has been completed. |
| First year of construction | 2010 |
| Last year of construction | 2016 |
| Discount rate | In accordance with NSW Treasury Guidelines, which is consistent with Infrastructure Australia's Prioritisation Methodology, a discount rate of 7% has been adopted. In addition, sensitivity testing has been undertaken which assesses the impact of alternative discount rates of 4% and 10%. |
| Appraisal period | The evaluation period starts in 2016/17 and ends in 2045/46 (30 years after the Metro opens). This is in line with Infrastructure Australia Guidelines that the project is to be evaluated over a 30 year period from the first full year of operation. |
| Remaining life | The indicative asset lives of the various metro components are:<br>• fixed infrastructure (e.g. track and tunnels) – 100 years;<br>• earthworks and drainage – 40 years;<br>• stations – 50 years; and<br>• rail/ metro cars – 35 years<br>Each item is depreciated in a straight line to determine the residual value based on construction year. The residual value is analysed in the final year of the economic appraisal. |
| Residual value | |
| Benefit ramp up | The patronage ramp-up factors assumed in the economic appraisal following the opening of the CBD Metro in 2017 are as follows:<br>• 2017: 80%;<br>• 2018: 85%;<br>• 2019: 90%;<br>• 2020: 95%; and<br>• 2021+: 100%.<br>This is based on a review of recent public transport planning studies in Sydney as well as relevant projects overseas[4]. |
| Capital cost | Total capital cost for the base case is estimated to be $4.822 billion, This cost includes provision for construction, rolling stock, contingency, contractor profit as well as net land costs.<br>Note, for the purposes of the preliminary economic analysis, all costs are expressed in 2008 values. |
| Maintenance costs | |

[4] Patronage Ramp-up Factors for New Rail Services, Douglas Economics Ltd, 2003

| | |
|---|---|
| | These costs have been derived through detailed operational modelling of the proposed system and have been benchmarked by the Shadow Operator against other metro schemes worldwide. |
| Operating costs | The operating costs are included in the estimate in the above row. |
| Benefit components | Quantifiable benefits include:<br><br>• Savings in the resource value of vehicle operating costs;<br>• savings in road and rail decongestion;<br>• savings in externality costs (air pollution, greenhouse gases, noise pollution, crashes and road damage);<br>• public transport user travel time costs;<br>• incremental fare revenues; and<br>• residual value of assets (described above).<br><br>These parameters are subject to the benefit ramp-up discussed above.<br><br>It is also expected that there will be wider economic impacts of the CBD Metro and future extensions, including effects relating to agglomeration (i.e. commercial activities being located closer together), densification of labour markets, and the transition to more productive/ higher value employment activities, as well as organisations' and households' behavioural adaptations to changes in transport costs and improvements in accessibility. |
| Cost and benefit time streams | To be provided on completion of modelling analysis. |
| Other | See attachment 1 |
| Related initiatives | |

B.2 CBA Results See Attachment 1

TABLE 1 – CBA RESULTS:

| | Discount Rate (%) | | |
|---|---|---|---|
| | 4% | 7% | 10% |
| BCR | | | |
| NPV ($m, 2008 dollars) i.e. 'Net Benefit' | | | |
| NPV / $ | | | |
| IRR | | | |

TABLE 2 – MONETISED BENEFITS AND COSTS:

| Monetised costs/benefits | Cost | |
|---|---|---|
| COSTS | | |
| Capital costs | | |
| Operation and Maintenance costs | | |
| Total Costs | | |
| | Value | Percentage |
| BENEFITS | | |
| Travel time savings | | |
| Vehicle operating cost savings | | |
| Environmental cost savings | | |
| Decongestion benefit | | |
| Total Benefits | | |

B.3 Sensitivity Testing

TABLE 3: BCR SENSITIVITY TESTING RESULTS: (7% discount rate)

| Test # | Variation | BCR | % Increase from '0' |
|---|---|---|---|
| 0 | Starting result | | |
| 1 | Discount rate 4% | | |
| 2 | Discount rate 10% | | |
| 3 | Construction costs plus 20% | | |
| 4 | | | |

# Appendix E – Summary of Initiative Appraisal - Key Results and Assumptions

## Part C – Non-Monetised Benefits and Costs

TABLE 4 – NON-MONETISED BENEFITS AND COSTS

| Cost/Benefit | Description | Rating |
|---|---|---|
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

## Part D – Appraisal Summary Table (AST)

OPTIONAL – NOT COMPLETED

## Part E –Information Sources


ATC, *National Guidelines for Transport System Management in Australia*, Volume 3, 2006

Austroads, *Austroads Technical Report: Up-date of RUC Unit Values to June 2005*, Sydney, 2006

CityRail, A Compendium of CityRail Travel Statistics, Sixth Edition, June 2008

Dandie, S and Mercante J 2007, "Australian labour supply elasticities: comparison and critical review", *Treasury Working Paper 2007*, 4 October 2007

*Douglas Economics, North West Transport Link Economic Appraisal, Wellington, New Zealand 2005*

Graham, D.J. 2007, *Agglomeration Economies and Transport Investment,* Joint Transport Research Centre, Discussion Paper 2007-11

Graham, D, Youn Kim , H 2008, An empirical analytical framework for agglomeration economies, Ann Reg Sci, 42:267-289

Greg, P, Johnson, P. and reed H. 1999, "Entering work and the British tax and benefit system" *IFS Reports*, R59

Meyrick and Associates, *East West Needs Assessment: Economic Benefits and Costs Analysis – Technical Report,* prepared for the East West Transport Link Team, March 2008

NSW Treasury, NSW Government *Guidelines for Economic Appraisal*, TPP07-5, July 2007

RTA, *Economic Analysis Manual*, (Version 2, 1999; May 2006 update), Appendix B

## ATTACHMENT 1: AN INITIAL ASSESSMENT OF THE BENEFIT COST RATIO

### Modelling Approach

Patronage forecasts, changes in demand for existing modes and transport user benefits have been estimated using the NSW Government Sydney Strategic Travel Model, operated by the Transport Data Centre for projecting travel patterns under different land use, transport, timetable and pricing scenarios. It can be used to test alternative settlement, employment and transport policies, to identify likely future capacity constraints, or to determine potential usage levels of proposed new transport infrastructure or services.

The Sydney Travel Model uses the EMME transport planning platform to estimate transport demand within the Sydney and Illawarra Statistical Divisions, and Newcastle Sub-Statistical Division. It is calibrated using data from TDC's continuous annual Household Travel Survey and also incorporates the latest TDC small area population and employment forecasts.

### Model Results

A number of initial model runs for the Benefit Cost Ratio (BCR) for the CBD Metro were recording outcomes in a preliminary range of

This preliminary range excludes wider economic benefits (WEBs) and the impact of the Australian Bureau of Statistics latest view of Sydney's population rising to 6.0m by 2036, which is 500k higher than has been modelled to date.

Some initial BCR model runs for proposed options which combine the CBD Metro with a West Metro (to Parramatta) or a North-West (to Macquarie Park) have somewhat lower BCRs. This appears to be inconsistent with previous BCR appraisal results obtained for other metro corridors in Sydney. Further detailed modelling and validation is required before any conclusions can be drawn.

### Next Steps

The focus in the next round of model runs is now on improving the robustness of assumptions in relation to base case and CBD Metro patronage, verifying de-congestion benefits accruing elsewhere in the transport network, verifying interchange/transfer impacts and evaluating how the bus network would be rationalised with a CBD Metro and the consequences for rail patronage.

Consequently, the BCR for the wider network i.e. CBD plus extensions will be reappraised by early December. It will include Wider Economic Benefits, latest population forecasts and is expected to show:

- reduced crowding on the CityRail network
- improved travel times for metro and road commuters
- reduced bus congestion along key corridors
- reduced heavy rail congestion
- development within the rail corridor and station areas – Transit Oriented Development
- improved environmental outcomes including greenhouse gas emissions
- reduced road congestion, usage and accidents.

# Outline of *Infrastructure Australia's* Prioritisation Methodology

## Appendix E template

# Appendix E – Summary of Initiative Appraisal - Key Results and Assumptions

## Part A – Overview

Title of Initiative – West Metro

Stakeholder –
Ministry of Transport
ABN 25 765 807 817

Contact –
Mr Rodd Staples
Director, Centre for Transport Planning & Product Development
(ph) 02 9268 2218
(fax) 02 9268 2208
(email) Rodd.Staples@transport.nsw.gov.au
227 Elizabeth St, Sydney NSW 2000

Summary of submission –
The West Metro initiative involves a rail line with high-frequency, rapid train services within Sydney's western corridor which links the Sydney CBD with Parramatta and western Sydney. West Metro would provide significant additional capacity to Sydney's busiest corridor and significant relief to road congestion into and within the Sydney CBD.

This corridor accounts for 9.26 million passenger kilometres of daily travel (Urban Transport Statement, 2006). The Western corridor is home to nationally significant economic activity, accounting for 12 per cent of the total national Australian GDP in 2008.

This submission is separate to, but supportive of the IA submission "Sydney CBD Metro" which identifies how a core Metro line in the centre of Sydney forms the enabler for a wider Metro Network of extensions including this proposal to the West.

The feasibility study is assessing a range of metro-style rail option alignments as well as other transport modes and operational options. This work is being jointly funded by the Commonwealth and NSW Governments. The study will identify a short list of preferred options by mid November with accompanying BCRs provided in early December. These options will be subjected to detailed investigation and evaluation so that a preferred option with a related BCR is identified by March 2009.

The capital cost for the scope of the proposed project is estimated to be $5.3 billion (discounted) and construction could commence from 2011.

The West Metro will operate as a catalyst for urban revitalisation and most of the Western suburbs of Sydney will benefit from a West Metro line through reduced crowding and congestion, lower emissions and the facilitation of employment growth and industrial diversification.

# Appendix E – Summary of Initiative Appraisal - Key Results and Assumptions

## Part B – Cost Benefit Analysis (CBA) – Monetised Benefits and Costs

### B.1 Key Assumptions

| Item | Assumption |
|---|---|
| Key drivers | Home to one third of Australia's population, NSW's population is set to increase from 7 million to 7.6 million by 2018. NSW also continues to attract more overseas migration than any other state or territory, currently absorbing 30% of Australia's net overseas migration. Demographic trends such as the ageing population and urban spread into coastal and new urban areas will further drive demand for infrastructure. Around 70% of NSW's population growth is forecast to occur in the Greater Sydney Region, where 78% of the State's population will reside by 2018.<br><br>This growth will accelerate demand for new and upgraded infrastructure. How effectively this demand is met will directly impact on the economic growth and prosperity of NSW and the nation. Economic modelling demonstrates that investment in top priority infrastructure projects in NSW could permanently increase Real Gross State Product by around 3%, equivalent to an increase in today's GSP of $8.8 billion every year and increase State export volumes by around 9% per annum.<br><br>The study area is home to a substantial number of companies registered in NSW. This concentration will generate an estimated $125 billion economic activity in 2008-9 which equates to 12 percent of the total national Australian GDP and over 38 percent of the GDP of the Sydney area. To put this in a broader economic context, the Study Area generates comparable economic activity to the combined state economies of South Australia, the Northern Territory, Tasmania and the Australian Capital Territory, which together accounted for 12.1 percent of total Australian GDP during the 2007 financial year.<br><br>The corridor which forms the study area contains 671,000 jobs, making it a major employment zone which accounts for 32 percent of the Sydney workforce. The study area is also a key growth zone for new jobs with a net forecast increase of 86,000 jobs over the next 23 years to 757,100 in 2031.<br><br>The study area currently provides homes for 612,900 people. This is forecast to increase by 23 percent to 754,740 in 2031 (or about 12 percent of Sydney's population). The household consumption of people living within the study area provides significant spending to support major retail centres at locations including Parramatta, Penrith and Burwood. |

| | |
|---|---|
| | Consequently, the study area is a generator of nationally significant economic activity. The geographic features of the corridor necessitate the provision of sizable transport infrastructure supply to connect the population to the commercial businesses operating within the corridor.<br><br>The existing Main West rail corridor connects the Blue Mountains, Penrith, Richmond and Parramatta to the Sydney CBD and surrounding employment centres. Current congestion on the Main West Corridor is the highest on the Sydney rail network, with an AM peak hour average loading of 130 per cent, (where a loading of 100 per cent means that all passengers have a seat). A significant number of services exceed "crush capacity" of 135 per cent, and occasionally, trains travel with loads of up to 180 per cent.<br><br>The demand for travel is growing faster than population. Since 1987 Sydney's population has grown by more than 21% and car trips have increased by 41%. While the initiatives within the NSW Government's *Urban Transport Statement* will provide relief to congestion, it is recognised that population growth will continue to absorb this additional capacity.<br><br>The key drivers for the West Metro initiative are:<br>▪ access to employment centres within the corridor (i.e. Parramatta);<br>▪ congestion in the western corridor, (main western rail line, Parramatta Rd and M4 Motorway);<br>▪ congestion into and within the Sydney CBD;<br>▪ ongoing growth in population and employment and<br>▪ congestion related impacts on economic development.<br><br>The western Sydney corridor has strategic State and National significance in terms of productivity and is increasingly becoming constrained by rising levels of urban congestion. This corridor requires additional investment in public transport systems to support ongoing development and prosperity. |
| Base case | The base case was existing rail/transport policy settings and Cityrail and RTA investment strategies. |
| First year of construction | 2011 |
| Last year of construction | 2017 |
| Discount rate | In accordance with NSW Treasury Guidelines for Economic Appraisal, a discount rate of 7% will be adopted for the rapid economic appraisal, with sensitivity tests undertaken around alternate discount rates of 4% and 10%. |
| Appraisal period | Thirty years from the first full year of operation, as per ATC guidelines and NSW Treasury Guidelines. |
| Remaining life | The indicative asset life (economic life) of the metro project is 50 years, in accordance with ATC guidelines. |
| Residual value | Detailed assessment of the residual value will be made |

| | |
|---|---|
| | during the forthcoming economic analysis. |
| Benefit ramp up | *First full year of operation – 80%*<br>*Second year – 85%*<br>*Third year - 90%*<br>*Fourth year - 95%* |
| Capital cost | Total capital cost for the project case is estimated to be $8.1bn, resulting in a :<br><br>The capital cost is based on a strategic cost estimate which includes property acquisition costs. These costs include contingency factors.<br><br>These cost have been subject to the following ramp-up over the nine years of construction:<br>4%, 4%, 4%; 9%, 9%, 21%, 20%, 13%, 17%<br><br>Escalation and constructor overheads / profits have been stripped from capital costs. |
| Maintenance costs | Are included in operating costs |
| Operating costs | |
| Benefit components | Quantifiable benefits will be analysed according to the following parameters:<br>• vehicle operating costs;<br>• public transport user travel time costs;<br>• net incremental revenue;<br>• road decongestion costs; and<br>• environmental costs (externalities).<br>The rule of half has been applied to induced or diverting travellers.<br>These parameters are subject to the benefit ramp up discussed above.<br>Non quantifiable benefits will be identified and evaluated according to IA's framework. |
| Cost and benefit time streams | |
| Other | |
| Related initiatives | |

## B.2 CBA Results See Attachment 1

### TABLE 1 – CBA RESULTS

| | Discount Rate (%) | | |
|---|---|---|---|
| | 4% | 7% | 10% |
| BCR | | | |
| NPV ($m, 2008 dollars) i.e. 'Net Benefit' | | | |
| NPV / $ | | | |
| IRR | | | |

*In the following table:*

- *Column 1 - List all cost and benefit elements that have been monetised*
- *Column 2 - State the $ value of each cost and benefit element*
- *Column 3 - Include the % contribution of each cost and benefit element - adding to a total of 100% across costs; and 100% across benefits*

*If no benefit cost analysis has been undertaken, provide a rough estimate of the percentage of total benefits and cost and some assumptions that will be made in the future BCA.*

### TABLE 2 – MONETISED BENEFITS AND COSTS ($m, 2008 dollars)

| Monetised costs/benefits | Data sources | |
|---|---|---|
| COSTS | | |
| Capital Cost | Specialist engineering assessments | |
| Operating Cost | Specialist engineering assessments | |
| | Data sources | |
| BENEFITS | | |
| Value of travel time | Latest Cityrail 2008 figures, most applicable to rail projects in NSW | |
| Decongestion | NSW RTA Manual, Appendix B - Economic Parameters 2007 | |
| Externalities | Cityrail, Compendium of CityRail Travel Statistics, Sixth Edition 2008 | |
| Vehicle Operating Costs | RTA Manual, Appendix B, Economic Parameters 2007 | |
| | | |
| | | |
| | | 100% |

## B.3 Sensitivity Testing

*Complete the following table as a summary of the results of the sensitivity testing undertaken. The Appraisal Guidelines refer to four types of area of uncertainty to test:*

- *Capital costs*
- *Construction duration and therefore opening date*
- *Operating (including maintenance) costs*
- *Under and over estimation of the benefits (typically demand for the service).*

[1] NSW State and Regional Population Projects 2006-36 (P16):2008 Release, Department of Planning 20 October 2008

TABLE 3: BCR SENSITIVITY TESTING RESULTS

| Test # | Variation | BCR | % Increase from '0' |
|---|---|---|---|
| 0 | Starting result | | |
| 1 | Discount rate 4% | | |
| 2 | Discount rate 10% | | |
| 3 | | | |
| 4 | | | |
| 5 | | | |
| etc | Etc | | |

# Appendix E – Summary of Initiative Appraisal - Key Results and Assumptions

## *Part C – Non-Monetised Benefits and Costs*

In Table 4:

- *List and briefly describe any "non-monetised" benefits and costs.*
- *Rate the size of each non-monetised cost and benefit element using the rating scale given in section 4 of the IA Appraisal Guidelines*

TABLE 4 – NON-MONETISED BENEFITS AND COSTS ($m, 2008 dollars)

| Cost/Benefit | Description | Rating |
|---|---|---|
| e.g. Visual Amenity | | |
| e.g. Biodiversity | | |
| etc | | |
| | | |
| | | |
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| | | |
| | | |
| | | |

## *Part D – Appraisal Summary Table (AST)*

*Part D is OPTIONAL.*

*A presentation option is to summarise all monetised and non-monetised benefits and costs side-by-side in an AST. This can be a particularly useful format when there is considerable mix of monetised and non-monetised benefits/costs.*

*For details on how to design and complete an AST, refer to the ATC National Guidelines for Transport System Management in Australia, Volume 3, Appendix B:*
http://www.atcouncil.gov.au/documents/pubs/National_Guidelines_Volume_3.pdf

## *Part E –Information Sources*

*List and detail the sources of information used in this appraisal*

## ATTACHMENT 1: AN INITIAL ASSESSMENT OF THE BENEFIT COST RATIO

### Modelling Approach

Patronage forecasts, changes in demand for existing modes and transport user benefits have been estimated using the NSW Government Sydney Strategic Travel Model, operated by the Transport Data Centre for projecting travel patterns under different land use, transport, timetable and pricing scenarios. It can be used to test alternative settlement, employment and transport policies, to identify likely future capacity constraints, or to determine potential usage levels of proposed new transport infrastructure or services.

The Sydney Travel Model uses the EMME transport planning platform to estimate transport demand within the Sydney and Illawarra Statistical Divisions, and Newcastle Sub-Statistical Division. It is calibrated using data from TDC's continuous annual Household Travel Survey and also incorporates the latest TDC small area population and employment forecasts.

### Model Results

A number of initial model runs for the Benefit Cost Ratio (BCR) for the CBD Metro were recording outcomes in a preliminary range of '..

This preliminary range excludes wider economic benefits (WEBs) and the impact of the Australian Bureau of Statistics latest view of Sydney's population rising to 6.0m by 2036, which is 500k higher than has been modelled to date.

Some initial BCR model runs for proposed options which combine the CBD Metro with a West Metro (to Parramatta) or a North-West (to Macquarie Park) have somewhat lower BCRs. This appears to be inconsistent with previous BCR appraisal results obtained for other metro corridors in Sydney. Further detailed modelling and validation is required before any conclusions can be drawn.

### Next Steps

The focus in the next round of model runs is now on improving the robustness of assumptions in relation to base case and CBD Metro patronage, verifying de-congestion benefits accruing elsewhere in the transport network, verifying interchange/transfer impacts and evaluating how the bus network would be rationalised with a CBD Metro and the consequences for rail patronage.

Consequently, the BCR for the wider network i.e. CBD plus extensions will be reappraised by early December. It will include Wider Economic Benefits, latest population forecasts and is expected to show:

- reduced crowding on the CityRail network
- improved travel times for metro and road commuters
- reduced bus congestion along key corridors
- reduced heavy rail congestion
- development within the rail corridor and station areas – Transit Oriented Development
- improved environmental outcomes including greenhouse gas emissions
- reduced road congestion, usage and accidents.