



# Appendix A

## INFRASTRUCTURE AUSTRALIA TEMPLATES

### Proposal Summary

Initiative Name:	M5 East Expansion
Location (State/Region(or City)/ Locality):	Sydney, NSW
Name of Proponent Entity:	NSW Government
Contact (Name, Position, phone/e-mail):	Brian Watters Director Major Infrastructure (tel) 02 8588 5700 (fax) 02 8588 4170 (email) brian_watters@rta.nsw.gov.au Roads and Traffic Authority of New South Wales Level 17, 101 Miller Street, North Sydney NSW 2060
Project Description:	<p>The M5 East Expansion proposal comprises the duplication of the existing M5 East Freeway to provide four lanes in each direction from King Georges Road, Beverly Hills to Marsh Street, Arncliffe, to provide four lanes in each direction and the provision of a new surface road (South Sydney connection) along the F6 Corridor with two lanes in each direction from the M5 East tunnels at Arncliffe to St Peters, with ramps connecting to Qantas Drive. Key features of the proposal include:</p> <ul style="list-style-type: none"><li>• three lanes in each direction under King Georges Road to compliment the proposed widening of the M5 South West Motorway to three lanes in each direction</li><li>• four lanes to be provided in each direction in tunnel by construction of new twin two lane westbound tunnels, maintaining the existing M5 East eastbound tunnel and reconfiguring the existing westbound tunnel to an eastbound tunnel</li><li>• maintaining two lane connection in each direction between the M5 East tunnels and General Holmes Drive</li><li>• a continuous two lane connection in both directions, in viaduct, from the eastern M5 East tunnel portals to the South Sydney connection</li><li>• signalised intersections on the South Sydney connection to Campbell Road, with a link to Gardeners Road at Bourke Street, and Euston Road</li></ul> <p>The location of the M5 East Expansion within the Sydney area and within the M5 Corridor are indicated in the attached plans.</p>



Theme alignment	<p>Recognising the national significance of both Sydney Airport and Port Botany, the NSW Government is putting forward the \$4 billion M5 East Expansion proposal for delivery in partnership with the Australian Government.</p> <p>The current and future development of Port Botany is predicted to double the movement of containers through Port Botany by 2029 while growth at Sydney Airport will double passenger and freight movements over the next decade. Current and future NSW Government rail initiatives to achieve the goal of 40% movement of freight by rail will support the growth at Port Botany, although with a predicted 1.8 million containers remaining to be transported by road investment in road infrastructure is required transfer freight from Port Botany to distribution centres in the west and south-west of Sydney.</p> <p>The M5 East Expansion, that will provide improved access to Port Botany and Sydney Airport while also providing increased road capacity for the movement of freight to key distribution centres, supports Infrastructure Australia's theme to create competitive international gateways by development of land transport systems which compliments the development of more effective ports and to cater for predicted increases in imports and exports.</p> <p>This investment in landside infrastructure is critical to Australia's economic growth, Sydney's ongoing success as a global city in the Asia-Pacific Region and its prominence for the nation.</p>	
Capital Cost of Initiative by Proponent (\$m, nominal, undiscounted)	\$4 billion in 2008 dollars	
Commonwealth contribution sought by Proponent, and cash flow in financial years (\$m, nominal, undiscounted)	<p>It is anticipated that funding for the M5 East Expansion may come from a number of sources – the Federal Government, the NSW Government and the private sector.</p> <p>The balance of funding sources needs to be agreed between the Federal and NSW Governments in the context of other transport and infrastructure initiatives.</p>	
Other funding (source/amount/cash flow) (\$m, nominal, undiscounted)	The Federal Government has provided \$5 million and the NSW Government has provided \$10 million to fund the M5 Transport Corridor Feasibility Study	
BCR by Proponent excluding Wider Economic Benefits	1.67	
High level development and implementation program	<p>Environmental Assessment      Jan 2010 to Mar 2011</p> <p>Planning Approval                      Late 2011</p> <p>Based upon assumed commitment to funding the delivery of the M5 East Expansion, the procurement process could commence in early 2011 with construction occurring between early 2013 and late 2016.</p>	
Confidentiality	Full submission	

Figure 1 Regional Context for M5 East Expansion

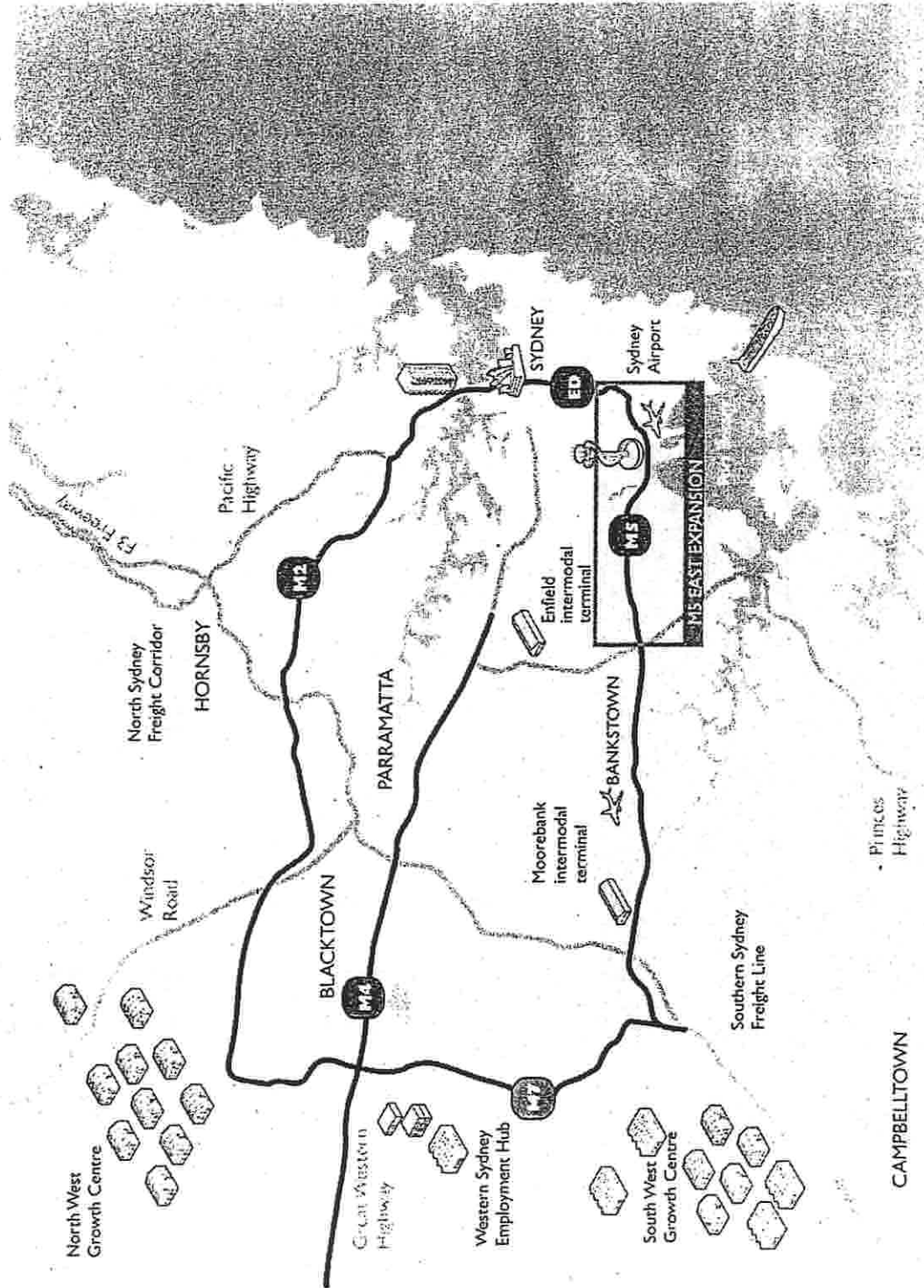
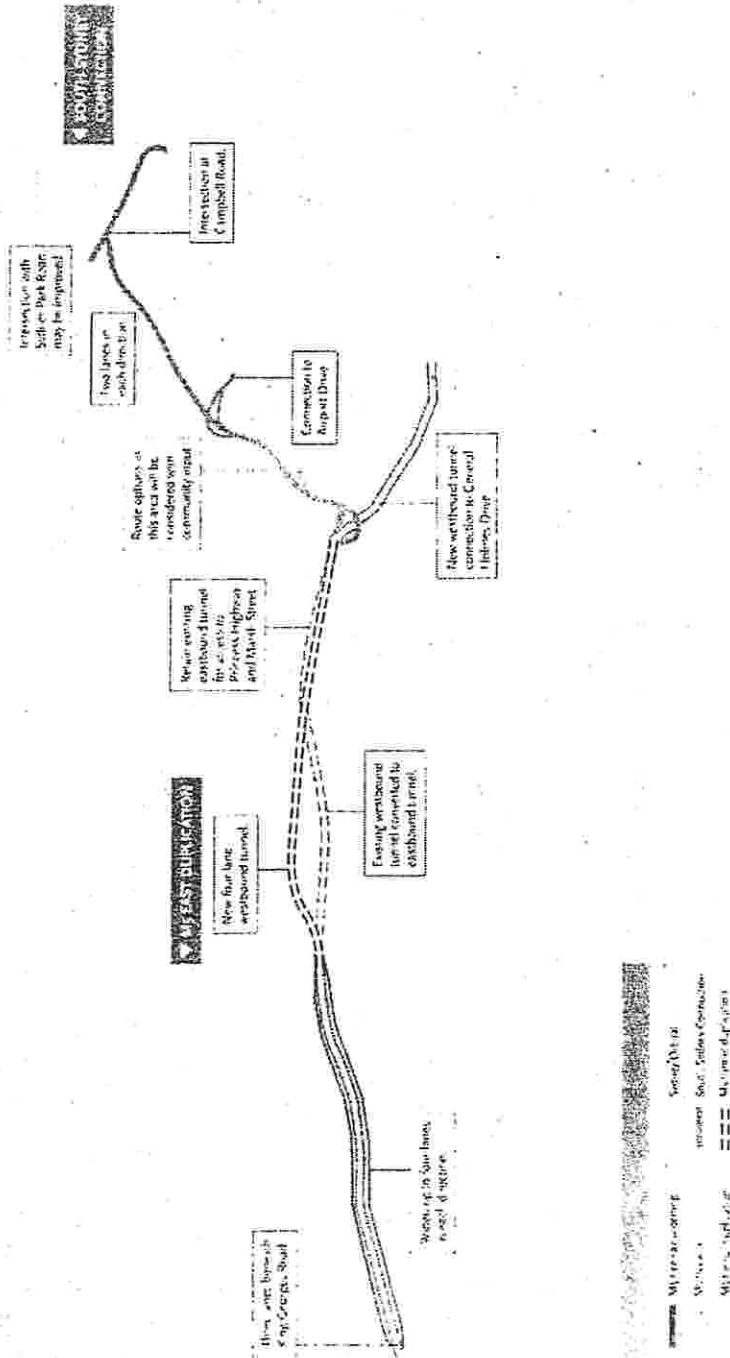


Figure 2 M5 East Expansion



**STAGE 1: GOAL DEFINITION**

<p>Goal Statements</p>	<p>The M5 East Expansion seeks to identify necessary landside infrastructure improvements to service growth at the international gateways of Sydney Airport and Port Botany and the intensification of employment lands along the M5 Corridor and in Greater Western Sydney.</p> <p>The identification of improvements as part of the M5 East Expansion proposal have been developed to support the following National Goals identified by Infrastructure Australia:</p> <ul style="list-style-type: none"> <li>• Increase economic standard of living for Australians.</li> <li>• Environmental sustainability and reduced greenhouse gases.</li> <li>• Better social outcomes, quality of life, and reduced social disadvantage in our cities and regions.</li> </ul> <p>Complimentary to these, the NSW Government has released a number of other plans and strategies in recent years to guide the growth and development of Sydney, which is forecast to continue to experience significant population, economic and travel growth.</p> <p>The concept for the M5 East Expansion has been developed within the context of these strategic plans and seeks to respond to the existing and emerging demands of this dynamic area of Sydney. What follows is a brief overview of the relationship between the M5 East Expansion and key NSW Government planning documents.</p> <p>The M5 East Expansion would contribute to the following goals and priorities within the NSW Government's <i>State Plan</i>:</p> <p>Goals:</p> <ul style="list-style-type: none"> <li>• Strengthening Business and Supporting Jobs.</li> <li>• Better Transport and Infrastructure.</li> </ul> <p>Priorities:</p> <ul style="list-style-type: none"> <li>• Priority P2 – Maintain and invest in infrastructure.</li> <li>• Priority P5 – AAA rating maintained.</li> <li>• Priority E3 – Cleaner air and progress on greenhouse gas reductions.</li> <li>• Priority E5 – Jobs closer to home.</li> <li>• Priority E7 – Improve the efficiency of the road network.</li> <li>• Priority S6 – Increasing share of peak hour journeys on a safe and reliable public transport system.</li> <li>• Priority S7 – Safer Roads.</li> </ul> <p>The <i>Metropolitan Strategy</i> identifies the strategic importance of the M5 Corridor in providing for future employment and population growth. The need for greater accessibility between the South West Growth Centre and Sydney Airport, Port Botany and the CBD is also highlighted. The Strategy has set a target of doubling rail's share of container movements from around 20% to 40%, meaning that at least 60% of the container freight task will need be moved by road from Port Botany to industrial areas predominately in Sydney's west via the road network, further supporting the need for the M5 East Expansion.</p> <p>The <i>State Infrastructure Strategy NSW 2008–9 to 2017–18</i> was released following the work of the <i>Metropolitan Strategy</i>. It provides details of infrastructure being delivered and planned to meet the needs of Sydney's population growth, expansion and distribution outlined in the <i>Metropolitan Strategy</i>.</p>
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STAGE 1: GOAL DEFINITION

It identifies the important role of infrastructure to support industry and the need for new transport links related to employment lands in Western Sydney as growing areas for distribution and logistics businesses.

A new framework for transport planning in NSW is also being established. Key amongst these is *Connecting NSW: The Transport Blueprint*, to be released before the end of 2009. The Blueprint articulates the outcomes required of the transport system through to 2036 to support the economic development of Australia, NSW and major centres supporting the delivery of key transport infrastructure projects such as the M5 East Expansion. The Blueprint is structurally and operationally linked to the *Metropolitan Strategy*. It sets the strategic agenda, defining the tasks by both area and mode that are required to underpin growth and investment to maintain economic, social and environmental sustainability. It explores these issues on a geographic basis related to trip length, for local, district, metropolitan, regional and national connections.

The efficient movement of people and goods in and around Sydney is a key transport objective of the *Urban Transport Statement*. This statement confirms the strategic importance of the Sydney Orbital and identifies the M5 Motorway as a key part of the Liverpool to Port Botany economic corridor, with a total daily travel volume of 3.88 million passenger kilometres. The M5 East Expansion would relieve current congestion, thereby facilitating more efficient movement of people and goods. Of note, the *Urban Transport Statement* concludes that the F6 Corridor (which the South Sydney connection would utilise) is to be set aside for possible future transport use and/or open space. The design for the M5 East Expansion would be developed so as not to preclude the possible future use of this corridor.

At Federal Government level the Minister for Infrastructure, Transport, Regional Development and Local Government unveiled in 2008 the Government's approach to tackle urban congestion. This included contributing \$5 million towards a feasibility study into potential improvements to the M5 Corridor. In addition the Sydney Urban Corridor Strategy that outlines shared strategic priorities of the Australian and State/Territory Governments for the long-term development of the AusLink National Network identifies the M5 East as having major short-term deficiencies. These deficiencies are being addressed within the Strategy by the following short term priorities that are consistent with the M5 East Expansion works:

- Improve road and rail links from Port Botany and Sydney Airport to Western Sydney.
- Enhance landside port capability and freight distribution.

Objective  
Statements

A number of study objectives have been developed specifically for the M5 East Expansion. These study objectives are central to achieving state and national government priorities and goals for increasing the economic development and productivity of Sydney, NSW and Australia. The study objectives are as follows:

- Support Sydney's long term growth and global competitiveness by increasing the efficiency of its transport system.
- Improve the capacity and flexibility of the transport system to respond to future change and growth.
- Deliver a sustainable transport system that minimises its environmental cost, and contributes to reduction of greenhouse gas emissions.
- Promote efficient and sustainable urban form by encouraging investment and growth in identified centres.
- Provide better and more equitable access to key centres and activities.

**STAGE 1: GOAL DEFINITION**

	<ul style="list-style-type: none"> <li>Contribute to the improvement of quality of life for people in Sydney.</li> </ul> <p>In addition to meeting state targets as prescribed in the State Plan, project specific targets will also be developed during the detailed concept design stages. These project specific targets will not only align with the broader targets in achieving the study objectives they will also assist in guiding sustainable performance at a local level. At a higher level the state targets will form the performance benchmark against which the adequacy of the M5 East Expansion will be measured.</p> <p>Please refer to Table 3.1 of Section 3.4 of Appendix B of the M5 Transport Corridor Feasibility Study for a detailed outline of the study objectives against Infrastructure Australia's strategic priorities and State goals and targets.</p>
<p>Goal and Objective Alignment</p>	<p>It is recognised that in achieving National and State Goals as well as delivering on the study objectives will require a coordinated effort across all levels of governments. As such synergies between the study objectives, Infrastructure Australia's strategic priorities, as well as goals and targets within the NSW State Plan have been identified. A summary alignment against the Infrastructure Australia's National Goals and Strategic Priorities is provided below.</p> <p>Performance against National Goals:</p> <ul style="list-style-type: none"> <li>Increased economic standards of living for Australians: <ul style="list-style-type: none"> <li>Improves access to Port Botany and Sydney Airport.</li> <li>Caters for existing and future transport demand in the M5 Corridor.</li> <li>Reduces congestion in the M5 Corridor and on surrounding arterial network.</li> <li>Improves travel times for individuals and businesses using the corridor.</li> <li>Delivers a high quality, well-integrated and reliable transport network that supports economic development.</li> <li>Supports the prosperity and economic productivity of Sydney as Australia's only global city.</li> </ul> </li> <li>Environmental sustainability and reduced greenhouse gas emissions: <ul style="list-style-type: none"> <li>Reduces greenhouse gas emissions from vehicles, due to the removal of congestion conditions.</li> </ul> </li> <li>Better social outcomes, quality of life, and reduced social disadvantage in our regions: <ul style="list-style-type: none"> <li>Enhances access to health, education and leisure facilities.</li> <li>Caters for demand for trips that are not well served by public transport.</li> <li>Reduces congestion on the road network in the M5 Corridor and surrounding arterial network.</li> <li>Improves travel times for individuals and businesses using the corridor.</li> </ul> </li> </ul> <p>Performance against National Strategic Priorities:</p> <ul style="list-style-type: none"> <li>SP1 – Expand Australia's productive capacity: <ul style="list-style-type: none"> <li>Provides the necessary infrastructure to support the intensification and agglomeration of employment lands along the M5 Corridor and growth of Port Botany and Sydney Airport that are major contributors to the Australian economy.</li> </ul> </li> </ul>

STAGE 1: GOAL DEFINITION

- SP2 – Increase Australia's productivity:
  - Increases the productivity of Australia through:
    - Improved transfer of freight from Port Botany and Sydney Airport to the logistic centres in the Western Sydney.
    - Improved distribution of goods from the logistic centres and inter modal terminals at Enfield and Moorebank to the wider Sydney area.
- SP3 – Diversify Australia's economic capabilities:
  - Increases opportunities to encourage diversification of Australia's economy by:
    - Improving connectivity between major importing centres such as Port Botany and Sydney Airport that can deliver a wide range of goods for various commercial entities.
    - Improved access through reduced travel times between importing centres and growth centres such as the Western Sydney Employment Hub and the South West Growth Centre.
- SP4 – Build on Australia's competitive advantage:
  - Increases capacity that will support Australia's global competitive advantage by improving the efficiency of access to key centres within the M5 Corridor and across broader Sydney by:
    - Supporting the predicted future development of Port Botany and Sydney Airport.
    - Improving access by providing high quality transport links to freight distribution and warehousing centres.
    - Improve connectivity to markets along the eastern seaboard by improving access to the National AusLink Network.
    - Improved access from Western Sydney and Sydney Airport to the Global Economic Corridor.
- SP5 – Develop Australia's cities and regions:
  - Provides an efficient and well functioning transport network that will encourage continued growth in population and trade in and between the key centres. The expansion will also provide opportunities for improved:
    - Social equity through access to jobs and services, higher property values and greater social inclusion.
    - Urban form.
    - Employment distribution for local populations.
    - Access to and from Sydney Airport.
- SP6 – Reduce greenhouse gas emissions:
  - Removing the existing congestion problem has the potential to half the output of greenhouse gas emissions from vehicles.



**STAGE 1: GOAL DEFINITION**

- SP7 – Improve social equity and quality of life in Australia's cities and regions:
  - Improves community wellbeing, as commuters will receive travel time benefits from the expanded capacity. It will also provide improvements to social capital and quality of life by:
    - Reducing noise and improving air quality.
    - Reducing encroachment of vehicles onto the surrounding surface arterial road network.
    - Maintaining current access to local businesses.
    - Increasing opportunity for promoting pedestrian and cycle facilities.
    - Lowering vehicle operating costs.
    - Lowering crash rates.
    - Increasing labour force productivity and participation.
    - Improving connectivity between residential areas and centres of community and leisure activity.

**STAGE 2: PROBLEM IDENTIFICATION**

<p>Problem Identification: Current issues</p>	<p>Modelling based on the Sydney Metro Strategic traffic model indicates that the M5 East is already at capacity and would be operating significantly above theoretical capacity by 2016 with an increase in capacity of 50% through the widening of the M5 Motorway that is being proposed by Interlink Roads. This will be compounded with performance in travel times, deteriorating further by 2026 due to a reduction in current average travel speeds. Without the proposal, the M5 East will become a bottleneck in the whole M5 Corridor costing approximately \$3.8 billion of travel time over the next 30 years.</p> <p>In recent years a number of rail initiatives have been put in place to facilitate the movement of passengers and freight. While these initiatives have been successful, the quantum of growth will place significant pressure on the road network in both the vicinity of Mascot/Botany and across the broader Sydney Metropolitan region. As a result, it is considered that the adjacent motorway system cannot meet current or future transport demand without further improvements.</p> <p>Weekday traffic volumes routinely exceed 100,000 vehicles per day on the M5 Corridor resulting in significant levels of congestion and delays in peak hours. Due to the levels of congestion in the corridor, incidents on this motorway cause significantly more severe congestion and resultant diversions of traffic placing further pressure on the surrounding network.</p> <p>In this context, and in framing the response to the problem, a number of further factors also require consideration. These include developing an efficient and sustainable transport solution, which responds to the diversity and complexity of today's current travel patterns and assists in:</p> <ul style="list-style-type: none"> <li>• Meeting demand for trips that cannot be met by public transport and that are dependent on an efficient road network, for example: <ul style="list-style-type: none"> <li>• Work-related business and commercial trips, including shift work, trades, sales, construction activities and services.</li> <li>• Freight movements across the wider Sydney area and which do not originate from Port Botany.</li> <li>• Employment located outside key centres.</li> <li>• Air freight that is high value or perishable and cannot be transported by rail.</li> </ul> </li> <li>• Enhancing access to health, education and leisure facilities, for example: <ul style="list-style-type: none"> <li>• Prince of Wales Hospital, Randwick.</li> <li>• Sydney Children's Hospital, Randwick.</li> <li>• University of NSW, Kensington.</li> <li>• Randwick Racecourse, Randwick.</li> </ul> </li> <li>• Enhancing the transport network in a way that is environmentally sustainable and seeks to reduce greenhouse gases.</li> <li>• Delivering wider, socio-economic benefits, through connecting diverse communities with improved access to a wider range of goods and services.</li> </ul>
<p>Problem identification: Future scenarios</p>	<p>There a number of future drivers of change, particularly with respect to socio-demographic and economic change that will generate a range of passenger, commercial and freight trips and intensify levels of congestion on the road network that will compound this situation.</p> <p>Substantial increases in future travel demand are predicted to be generated along the M5 Corridor by:</p> <ul style="list-style-type: none"> <li>• Passenger and freight growth at Sydney Airport and Port Botany – a large proportion of which is</li> </ul>

STAGE 2: PROBLEM IDENTIFICATION

destined for, or originates from, Western Sydney.

- At Sydney Airport approximately 90% of passengers and meeters/greeters, together with all air freight, access the airport by road. Sydney Airport passengers are forecast to grow by two and half times (from 31 million to 79 million per year by 2029) air freight by more than double (from 471,000 tonnes to 1,077,000 tonnes by 2029) and Port Botany container trade to nearly double (from 1.8 million TEUs to 3 million per year) by the early 2020s.
- Currently 25,880 freight trips occur from Port Botany during the two hour AM peak – this is predicted to increase to 37,700 (46%) by 2021 and 47,935 (85%) by 2031.
- The NSW Government has also set a target of doubling the share of containers using rail to 40% by 2011 and inter modal terminals are proposed at Moorebank and Enfield to support the shift to rail transport. However, and in view of the forecast quantum of growth at Port Botany to around 3,000,000 containers by 2021, even if the targeted mode shift to rail is achieved, the number of containers transported by road will still double to around 1,800,000.
- Planned and significant intensification of residential and employment land uses in Sydney's south west – particularly in existing urban areas along and surrounding the M5 Corridor.
  - The predicted change in population in key centres along the corridor, such as Campbelltown and the South West Growth Centre, will increase by 155,750 by 2021 and 261,910 residents by 2031. While the predicted change in employment in key centres along the corridor, such as Liverpool, will increase by 29,080 by 2021 and 36,680 by 2031.

Taking these future demands into consideration, traffic sensitivity analysis was undertaken on various scenarios to assess the impact of changes to key assumptions that may impact on the M5 East Expansion, including:

- The predicted airport growth measured by the growth in passenger trips to and from the airport.
- The predicted mode shift for the transport of freight to rail, measured by the potential for a greater mode shift resulting from potential expansion of the proposed inter modal terminal at Moorebank.
- The delivery of the M4 extension as the total project or in stages measured by the change in traffic volumes along the M5 Corridor, together with changes in economic benefits which may occur as a result of the delivery of the project.

This scenario modelling demonstrated that:

- Lower than predicted passenger growth would not substantially reduce traffic volumes in the corridor.
- A reduction in truck movements through the M5 East tunnel. However, this reduction is not significant and amounts to around 100 trucks in the AM peak. This suggests a significant volume of trucks in the corridor carry freight that is not originating at Port Botany.
- Higher than predicted movement of freight from Port Botany by rail would not substantially reduce traffic volumes in the corridor.
- The M4 extension would cause only a minimal reduction in peak traffic volumes on the M5. These reduced traffic volumes would improve travel speeds on the M5 and potentially improve network operation.



**STAGE 2: PROBLEM IDENTIFICATION**

Uncertainties surrounding these drivers were considered minimal as mid-range figures were used for scenario analysis; if anything data used for problem identification was conservative. Future problems or challenges were also considered minimal as the M5 East Expansion does not affect future F6 and M4 expansions and it occurs within an existing transport corridor.

In contrast to socio-demographic and economic changes, it was considered that other potential drivers of change such as energy prices, climate change, technological change and governance change would have minimal impact on the delivery of the M5 East Expansion and were subsequently excluded from any scenario analysis. It should be noted however that the potential impacts of climate change on the M5 East Expansion will be addressed in detail as part of the Part 3A Environmental Assessment process.

**STAGE 3: PROBLEM ASSESSMENT**

<p>Problem assessment</p>	<p>From a strategic needs perspective, current and future transport demand represents a significant challenge to Sydney and NSW across all transport modes and particularly in the M5 Corridor. In view of the inextricable link between transport infrastructure and economic development and productivity, continued and targeted investment is required to ensure the delivery of high quality, well-integrated and reliable services that support economic development, prosperity and competitiveness of Sydney as Australia's global city.</p> <p>As such sustained congestion along the M5 Corridor will continue to inhibit future economic growth and be a major transport problem for Sydney. This will in turn affect the ongoing performance of the existing road infrastructure against achieving the National Strategic Priorities, in particular:</p> <ul style="list-style-type: none"> <li>• Expand Australia's productive capacity.</li> <li>• Increase Australia's productivity.</li> <li>• Develop Australia's cities and regions.</li> </ul>
<p>Current problems</p>	<p>The transport network in Sydney's inner west and south west plays a key role in the wider metropolitan transport system and in Sydney's economic productivity. It services both local, regional and national travel demands, providing key connections for freight, commercial and commuter traffic.</p> <p>While the high volume of traffic currently using the M5 Corridor is an indication of its success as a transport link, current traffic levels and a high percentage of heavy vehicles are resulting in the motorway operating at or near capacity for much of the day and particularly during the morning and evening peaks.</p> <p>This situation is leading to severe levels of congestion on key parts of the transport network, and resulting in significant costs to individuals, businesses and the environment.</p> <p>At a local level measured travel speeds in 2007 showed that a trip in the morning peak on the M5 East from King Georges Road to General Holmes Drive, a distance of 9.4km/h took approximately 16 minutes, with an observed travel speed of 35km/h. This compares to a sign posted speed of 80km/hour. This congestion along the M5 Corridor negatively impacts personal, business and in particular freight movements, as well as, bus passengers along alternate routes such as Canterbury Road and Stoney Creek Road. The cost/impact of this congestion results in:</p> <ul style="list-style-type: none"> <li>• Actual extra travel time – limiting the opportunity for productive activity of people travelling to and from work.</li> <li>• Extra time contingency needed to avoid being late.</li> <li>• Increased vehicle operating costs.</li> <li>• Increased crash rates.</li> <li>• Poorer air quality – increasing measures in the management of air quality within the tunnels.</li> <li>• Increased noise exposure for nearby residents.</li> </ul> <p>In addition there are wider environmental, social and economic impacts that affect the Sydney region these include:</p> <ul style="list-style-type: none"> <li>• Reducing the access for residents of Southern and South Western Sydney to higher value employment centres around the Sydney Airport, Port Botany, the City CBD, North Sydney and areas further afield such as Chatswood and Macquarie Park.</li> </ul>

**STAGE 3: PROBLEM ASSESSMENT**

	<ul style="list-style-type: none"> <li>• Limiting the capture of the societal/productive value of increased efficiency within the freight industry.</li> <li>• Limiting the efficient transportation into and out of Sydney Airport and Sydney Port precincts. Reducing the long-term sustainability, growth and productivity of these highly productive and nationally important industrial areas.</li> <li>• Limiting productivity improvements in reducing imperfect competition and labour supply.</li> </ul> <p>Supporting data:</p> <ul style="list-style-type: none"> <li>• 50 – 60 percent of full imported containers and up to 30 percent of full export containers are delivered to or originate from the inner-western suburbs of Sydney.</li> <li>• 86 percent of freight moved by road, with proportion of freight moved by road increasing over time relative to rail.</li> </ul>
<p>Future problems</p>	<p>There are a number of future drivers of demand that will further intensify the current levels of congestion in the corridor. These include growth at:</p> <ul style="list-style-type: none"> <li>• Sydney Airport and Port Botany.</li> <li>• The airport to CBD corridor.</li> <li>• The South West Growth Centre.</li> <li>• Western Sydney Employment Hub.</li> <li>• The M5 Corridor.</li> </ul> <p>The functionality of airports and ports are critical success factors for all global cities. They are the international gateways for importing and exporting goods, business travellers and tourists.</p> <p>Despite planned growth in the rail mode share, the road transport task will continue to grow for freight and passengers for these key centres. Road will remain the dominant landside transport mode. The quantum of growth will place significant pressure on the road network in both the vicinity of Mascot/Botany and across the broader metropolitan region.</p> <p>To meet future travel needs and demands continued and targeted investment is required. Investigations into improvements to the M5 Corridor are designed to channel this investment where it can deliver the greatest benefit.</p> <p>Supporting data:</p> <ul style="list-style-type: none"> <li>• By not having the M5 East Expansion operating in 2009 the economy is forgoing potential economic benefits of around \$230 million in 2009 dollars. This lost opportunity is escalated even further if there is a 5-year delay from 2016 in the delivery of the project. In this future scenario we are looking at lost economic benefit of \$2,000 million in outturn, \$1,165 million in 2009 dollars.</li> <li>• Several of the employment centres along the corridor which are predicted to have increased growth between 2006 and 2031 are: <ul style="list-style-type: none"> <li>• Campbelltown/Macarthur      22%</li> <li>• Liverpool                              73%</li> <li>• Sydney Airport/Port Botany      40%</li> </ul> </li> </ul>

**STAGE 3: PROBLEM ASSESSMENT**

	<ul style="list-style-type: none"> <li>• During 2006/07 container trade through Port Botany was 1.6 million TEU and with the expansion of Port Botany this trade is predicted to exceed 3 million TEU's per year by the early 2020s.</li> <li>• Future inter modal terminals identified for development in the future will be located at Moorebank and Enfield that directly or indirectly have access to the M5 Corridor.</li> <li>• Air freight from Sydney Airport in 2007 was 471,000 tonnes this is predicted to increase by 129% to 1,077,000 tonnes by 2029.</li> <li>• 25,880 freight trips currently during two hour AM peak, increase 46% to 37,700 in 2021, increase 85% to 47,935 in 2031.</li> <li>• Movement of freight in 2031 to and from Botany Bay area are predicted to increase by 187% and 196% respectively from movements in 2006. Predicted increases in distribution to and from key centres by 2031 along and connecting to the corridor include:             <ul style="list-style-type: none"> <li>• Liverpool – 194% (origin) and 194% (destination).</li> <li>• Campbelltown – 209% (origin) and 202% (destination).</li> <li>• Penrith – 276% (origin) and 313% (destination).</li> </ul> </li> <li>• In 2007 31.9 million passengers travelled through Sydney Airport and this is forecast to increase by 2029 by up to 149% to 78.9 million.</li> <li>• Predicted increases of population growth centres between 2006 and 2031 are:             <ul style="list-style-type: none"> <li>• Campbelltown – South West Growth Centre (2.54%).</li> <li>• Liverpool – Campbelltown North (1.2%).</li> </ul> </li> </ul>
<p>Problem Prioritisation</p>	<p>Resolving both the current travel demand problems and accommodating future growth are interrelated and considered the highest priority in the delivery of the M5 East Expansion. In particular, allowing better distribution of traffic travelling to Port Botany and Sydney Airport and to the north to access the inner south Sydney urban redevelopment centre and Sydney CBD is considered key in addressing existing and future transport problems along the M5 Corridor.</p>

**STAGE 4: PROBLEM ANALYSIS**

<p>Problem analysis</p>	<p>The M5 Corridor services both local and regional travel demands, providing connections between Sydney's south-west and south-east, including Sydney Airport and Port Botany. The M5 Corridor also services interstate travel demands and forms part of the AusLink Network with the M5 South West Motorway and M5 East connecting Sydney with Melbourne and Canberra. In total, daily travel across all modes between Liverpool and Sydney Airport/Port Botany amounts to 3.88 million passenger kilometres.</p> <p>The M5 East is one of the most heavily utilised sections of the Sydney Orbital, carrying between 80,000 and 115,000 vehicles per day. Weekday traffic volumes routinely exceed 100,000 vehicles per day, with weekend traffic dropping by only around ten%. It should also be noted that the M5 East carries around 8,000 heavy vehicles per day, accounting for eight% of traffic. The M5 East is most heavily congested during weekday morning and afternoon peak hours, although it is increasingly congested in business hours and on the weekends.</p>
<p>Identify fundamental cause, not symptoms, of the problem</p>	<p>In addition to the existing demands and capacity constraints, in particular the existing arterial road surrounding the M5 East tunnel, the existing westbound tunnel and the interaction between traffic on and entering the M5 Corridor, the fundamental causes of the peak congestion problems along the M5 Corridor are:</p> <ul style="list-style-type: none"> <li>• Increasing travel demand generated by the growth in passenger, business and freight related activities at Sydney Airport and Port Botany.</li> <li>• Increasing travel demands generated by population growth, primarily in Sydney's south-west.</li> <li>• Increasing travel demand generated by the intensification and agglomeration of employment lands, including Milperra/Bankstown Airport, Moorebank, Ingleburn, Minto and Campbelltown.</li> <li>• Inability of surrounding road networks from the eastern motorway terminus to cater for any increase in traffic at the time of the original M5 East works.</li> <li>• Staging, rate and scale of the Port Botany expansions (larger than originally forecast at the time of the original M5 East works).</li> <li>• No provision of tolling along the original M5 East Motorway.</li> <li>• Introduction of the Sydney Orbital.</li> </ul>

**STAGE 5: OPTION GENERATION**

**REFORM (ESSENTIALLY NON-CAPITAL INVESTMENT) OPTIONS**

<p>Public transport – improvements to existing rail network</p>	<p>The existing East Hills (passenger) Line is operating at or near capacity on most sections of the corridor. Improvements to the existing rail corridor through changes to signaling, rolling stock and services is not anticipated to have significant increases in the capacity of the line, or result in significant mode shift from private vehicle usage which would be sufficient to meet future transport demand in the corridor.</p> <p>There are a number of initiatives that support the policy of 40 percent mode shift from road transport to rail, including the South Sydney Freight Line, however, these are unlikely to reduce the overall demand to meet the needs of commuter, commercial and other work-related travel along the M5 Corridor.</p> <p>At present, road based public transport services tend to be limited to supporting interchanges with the rail transport. There are limited services into the key centres of Port Botany, Sydney CBD, Sydney Airport and south west Sydney and improvements to these services are not considered to assist in meeting the high transport demand between Sydney's east and south west.</p> <p>There are no sections of the M5 Corridor where improvements to public transport facilities may form part of an overall project that could meet the study objectives.</p> <p>It should be noted that the M5 East Expansion may provide opportunities for improving public transport services.</p>
<p>Demand management – tolling regimes and policy review</p>	<p>The implementation of demand management measures such as variable tolling, road pricing, congestion tolling, road user charges or parking strategies would lead to either a redistribution of traffic to the surrounding road network, or force travelers to shift to rail/public alternatives.</p> <p>The redistribution of vehicles to alternative routes would provide limited additional capacity for freight movement and would lead to a number of social and environmental impacts on the arterial network surrounding the motorway.</p> <p>Alternatively the current capacity constraints on the rail network through this corridor limit the opportunities to achieve the efficiency improvements as sufficient mode shift cannot be achieved without significant investment to establish a rail network with a greatly increased capacity.</p> <p>There are no sections of the M5 Corridor where demand management strategies may form part of an overall project that could meet the study objectives. However, it is noted that demand management should be investigated, principally through consideration of the alternative tolling regimes and during detailed project development.</p>
<p><b>INVESTMENT OPTIONS</b></p>	
<p>Surface road network – improve operation or increase capacity of the existing arterial road network</p>	<p>The land use adjacent to the existing arterial network generally comprises established commercial and residential development with limited capacity for further development.</p> <p>Any enhancements to the existing road network will not provide significant improvements to the efficient movement of transport or improve the capacity of the corridor sufficiently to cater for the future growth in transport demand along the corridor.</p> <p>Any reduction in traffic congestion will be short term with congestion levels returning to current levels or worse in the near future. This increase in congestion will result in redistribution of traffic to other arterial roads or the sub-arterial road network, impacting on the communities and business on these</p>

STAGE 5: OPTION GENERATION

	<p>routes through increased noise and air pollution and increasing the severance of these communities.</p> <p>There are limited road reservations along these corridors. Any widening of the arterial roads would have significant impacts on the adjacent land uses.</p> <p>There are no initiatives when applied to the arterial surface road network that could meet the study objectives.</p>
<p>Road tunnel – enhance existing road tunnel</p>	<p>The existing freeway/motorway corridor between Bexley Road, Earlwood and Camden Valley Way, Prestons contains sufficient open space surrounding the existing roadway or within the existing median to enable the capacity of the existing motorway to be increased by widening with limited impact on the surrounding land use.</p> <p>Widening of existing freeway between Marsh Street and General Holmes Drive is achievable with significant encroachment into the wetlands at Marsh Street and Eve Street (which together make up the Rockdale wetlands) and the Cooks River area.</p> <p>Any increase to the capacity of the motorway in this section will also increase the demand on the airport tunnel that, during peak periods, is operating at or near capacity and has limited capability to cater for additional traffic. This section of the motorway also has significant overall network impacts when incidents or breakdowns occur in the vicinity of the tunnel.</p> <p>The alternative route for accessing the Port Botany area is via Airport Drive, which is located around the northern perimeter of Sydney Airport. Increasing the capacity of Airport Drive can be achieved generally from Marsh Street through to Joyce Drive, where traffic can connect to General Holmes Drive to access Port Botany.</p> <p>Through the tunnel section of the corridor, Marsh Street, Arncliffe to Bexley Road, Earlwood a surface road or viaduct construction could be provided through the Wollie Creek area. It is recognised that this proposal would raise significant environmental and community concerns and result in significant severance of the communities on either side of the reserve and the residential areas in the Arncliffe and Bardwell Valley areas.</p> <p>The following are considered sections of the M5 Corridor where an increase in the capacity of the existing motorway may form part of an overall project that could meet the study objectives:</p> <ul style="list-style-type: none"> <li>• Central sub-corridor (eastern sector), comprising: <ul style="list-style-type: none"> <li>• M5 East Freeway – Bexley Road, Earlwood to King Georges Road, Beverly Hills.</li> </ul> </li> <li>• Central sub-corridor (western sector), comprising: <ul style="list-style-type: none"> <li>• M5 South West Motorway – King Georges Road, Beverly Hills to Hume Highway, Casula.</li> </ul> </li> </ul>
<p>Road tunnel – enhance existing road tunnel</p>	<p>The existing M5 East tunnel comprises twin two lane tunnels in the central sub-corridor between Marsh Street, Arncliffe and Bexley Road, Bexley North.</p> <p>The potential alternative to enhance the capacity of the existing tunnel comprise either:</p> <ul style="list-style-type: none"> <li>• Excavation of the tunnel ceiling to provide a structural ceiling over the existing lanes suitable for movement of vehicles; or</li> <li>• Widening the over side of the existing tunnel, including increasing the height of the tunnel ceiling (“double-decker”).</li> </ul>

STAGE 5: OPTION GENERATION	
	<p>Both these alternatives will reduce the existing congestion in the tunnel and provide increased capacity within the tunnel to cater for the future growth in transport demand.</p> <p>Improved efficiency of vehicles movement in the tunnel will be reduced by issues relating to connecting the enhanced tunnel with the arterial road that is operating at or near capacity.</p> <p>The alternative providing for widening of the tunnel can be designed such that the additional lanes will be connected to existing on-load and off-load ramps. This reduces the requirement for merging and diverging of traffic in the tunnel and will generally provide additional capacity by providing two free flow lanes in each tunnel.</p> <p>The other alternative has significant issues in relation to connecting the additional traffic lanes, above the existing tunnel traffic lanes, into the surrounding network.</p> <p>The following are considered sections of the M5 Corridor where an enhancement to the capacity of the existing tunnel strategies may form part of a project that could meet the study objectives:</p> <ul style="list-style-type: none"> <li>• Central sub-corridor (eastern sector), comprising: <ul style="list-style-type: none"> <li>• M5 East Freeway – Widen existing road tunnel to provide three lanes in each direction.</li> </ul> </li> </ul>
<p>Road tunnel – provide additional road tunnel</p>	<p>The construction of additional tunnels which connect from Port Botany/Airport to the arterial network such as Canterbury Road or Forest Road/Stoney Creek Road may provide greater efficiency in the movement of vehicles through the tunnel, however these improvements in efficiency would be significantly reduced by the congestion resulting from the traffic merging with the existing (and already congested) arterial road network.</p> <p>Providing additional tunnels along the existing tunnel route will provide increased capacity. However, consideration should be given to the impact on the surrounding road network.</p> <p>Truck tunnels will support the increased demand for freight movement but will provide limited capacity for commercial and private transport. As a result of the predicted increase in commercial and private transport demand this would add to the current congestion in the existing M5 East Tunnel.</p> <p>The provision of 'express' tunnels connecting to Foreshore Road and/or Southern Cross Drive will support the predicted growth in freight, commercial and private demand and improve access to key centres such as Port Botany and the CBD. The provision of an express tunnel connecting to General Holmes Drive on the southern side of airport tunnel would impact of the existing congestion which occurs in this tunnel during peak periods.</p> <p>The M5 South West Motorway is owned and operated by the private sector, Interlink Roads. Interlink Roads have submitted to the RTA an unsolicited proposal for widening the motorway to three lanes in each direction by construction of additional pavement generally into the median.</p> <p>The following are considered sections of the M5 Corridor where an additional road tunnel may form part of a project that could meet the study objectives:</p> <ul style="list-style-type: none"> <li>• Central sub-corridor (eastern sector), comprising: <ul style="list-style-type: none"> <li>• M5 East Freeway – Marsh Street, Arncliffe to Foreshore Road, Mascot.</li> <li>• M5 East Freeway – Marsh Street, Arncliffe to Bexley Road, Earlwood.</li> <li>• M5 East Freeway – Bexley Road, Bexley North to King Georges Road, Beverly Hills.</li> </ul> </li> </ul>



**STAGE 5- OPTION GENERATION**

- Central sub-corridor (western sector), comprising:
  - M5 South West Motorway – King Georges Road, Beverly Hills to Fairford Road, Padstow.
  - M5 South West Motorway – Fairford Road, Padstow to Henry Lawson Drive, Panania.
  - M5 South West Motorway – Henry Lawson Drive, Panania to Hume Highway, Liverpool.
  - M5 South West Motorway – Hume Highway, Liverpool to Camden Valley Way, Prestons.

STAGE 6: OPTIONS ASSESSMENT

Long list

An overall study methodology comprising the following five components has guided the options assessment process for the M5 East Expansion:

- Needs assessment.
- Development of strategic options.
  - Corridor analysis.
  - Identification of strategies and actions.
  - Identification of initiatives.
  - Strategic merit test.
  - Identification of strategic options.
- Evaluation of strategic options (to identify a preferred strategic option).
- Refinement of the preferred strategic option (to identify the indicative preferred option).
- Feasibility assessment of the indicative preferred option.

The needs assessment addressed the rationale for prioritising the M5 East Expansion within the context of the M5 Corridor and the broader strategy for enhancing Sydney's transport network. The assessment found that the M5 East Expansion would provide a high quality, reliable and efficient enhancement of the road access to Sydney Airport and Port Botany that would relieve current traffic congestion, provide for future growth, improve connectivity to key centres and allow for greater flexibility in managing the road network, consistent with the foundations of the Metropolitan Strategy for Sydney.

Based on an initial analysis of the corridor and in line with the needs assessment, a range of broad strategic options were evaluated for the corridor, with a particular focus on:

- Surface network.
- Road tunnel options.
- Public transport initiatives.
- Demand management.

Following the identification of actions for each of the strategies, a review of the sub-corridors was undertaken to identify those transport routes and areas within the corridor and sub-corridors where initiatives may be applied. An initiative was generated when a strategy and its actions could be applied to a transport route. The application of these actions to transport routes identified within the corridor resulted in a long-list of initiatives for evaluation. This long list of initiatives identified was then assessed against the study objectives, utilising a strategic merit test methodology, to identify a short list of initiatives.

As a result of this assessment it was identified that initiatives applied to the arterial surface road network provided only a short term solution and would not cater for the long- term transport demand. Similarly improvements to public transport facilities or implementation of demand management strategies individually would not meet the long-term demand but may form part of an overall strategy that may meet the study objectives. It should be noted that opportunities for improving access to public transport services or the operation of public transport services will be investigated through the corridor, as part of the detailed development of the project. In addition demand management initiatives will be investigated, principally through consideration of the alternative tolling regimes and during detailed project development.

**STAGE 6: OPTIONS ASSESSMENT**

Interim list	<p>The conclusion from the strategic merit test process was that expansion of the existing motorway corridor was the only strategic option that could meet the study objectives. Subsequent development of potential strategies for expanding the existing motorway corridor resulted in proposals that provided for widening the existing surface motorway between Camden Valley Way, Prestons and Bexley Road, Bexley North and increasing the capacity of the road tunnel(s) between Bexley Road and Marsh Street, Arncliffe.</p> <p>As the section of the corridor between Camden Valley Way, Prestons and King Georges Road, Beverly Hills (M5 South West Motorway) is owned and operated by Interlink Roads, further assessment and evaluation of the section are separate to this proposal and any expansion to this section of the corridor would be the subject of negotiation between the owner/operator Interlink Roads and the RTA.</p> <p>Dependent upon the connection of the strategic options west of Bexley Road, widening the existing freeway would be determined to provide sufficient lanes in each direction to balance capacity up to King Georges Road.</p> <p>The following alternative tunnel arrangements were identified as being capable of addressing the problem could potentially meet the study objectives:</p> <p><i>Eastern section – M5 East Freeway: Port Botany and Airport to Bexley Road, Earlwood</i></p> <ul style="list-style-type: none"> <li>• Option A – Widen existing tunnels to three lanes between Marsh Street and Bexley Road.</li> <li>• Option B – New, two lane tidal flow tunnel between Marsh Street and Bexley Road/ King Georges Road.</li> <li>• Option C – New, twin two lane tunnels between Foreshore Road and Bexley Road/ King Georges Road.</li> <li>• Option D – New, twin two lane tunnels between Southern Cross Drive and Bexley Road/ King Georges Road.</li> <li>• Option E – New, three lane westbound tunnel between Marsh Street and Bexley Road/ King Georges Road.             <ul style="list-style-type: none"> <li>• Convert existing westbound tunnel to eastbound tunnel to access General Holmes Drive.</li> <li>• Maintain existing eastbound tunnel to provide access to Princes Highway and Marsh Street only.</li> </ul> </li> </ul>
Short list	<p>The next stage in the process involved a number of preliminary investigations to assist in the evaluation of the five strategic options (Options A to E) and to identify a preferred strategic option for detailed appraisal:</p> <ul style="list-style-type: none"> <li>• Traffic flows along the corridor and surrounding network.</li> <li>• Development of concept design for the road and tunnel alignment</li> <li>• Constructability.</li> <li>• Operational constraints including network connectivity.</li> <li>• Environmental and social impacts.</li> </ul> <p>The information gained from these investigations enabled strategic cost estimates to be prepared for the five strategic tunnel alternatives which was then used as the basis for a two-part evaluation process which included:</p>

### STAGE 6: OPTIONS ASSESSMENT

- Multi-criteria analysis (MCA).
- Rapid economic appraisal (REA).

The MCA was based on an assessment of environmental, social, delivery, transport efficiency and achieving government strategy criteria and demonstrated that of the five options, four – options B, C, D and E – could be taken forward for further assessment, with Option E delivering the most non-cost benefits. Option A was excluded due to constructability constraints.

The key steps in the REA process comprised of:

- Traffic modelling to determine current and future transport demand.
- Undiscounted benefits calculations based on road user benefits over the assessment period including:
  - Travel time savings.
  - Vehicle operating costs.
  - Accident costs.
  - Environmental costs.
- Producing key economic and financial indicators.
- Sensitivity analysis on key parameters.

The overall outcome of the REA and the MCA (Refer to Table 6.7 of the Preliminary Overview Report for quantitative results of this assessment) was the identification of Option E as the preferred strategic option and that it provided the greatest economic benefit for the funds expended and therefore the highest benefit cost ratio. Option E also provided the appropriate increase in tunnel capacity to balance the road network, resulted in comparable environmental impacts with other alternatives, could be constructed and was operationally sound.

Option E also provides the greatest capacity due to the addition of a three-lane tunnel that would result in greater opportunity to unlock land use potential and greater adaptability to future changes affecting the transport corridor. Essentially, Option E had the least number of detrimental effects and had fewer complicated delivery issues through the avoidance of soft soils. Some key points of discussion around Option E include:

- Environment – as with the other options, there were potential noise impacts to nearby receivers, that can be mitigated, and some impacts on biodiversity at the vicinity of portals are anticipated. The location of works may result in reduced impact on the existing Wollie Creek floodplain, as the existing constriction affecting the waterway under Bexley Road may be removed.
- Social – some impacts on the visual character and parklands of the area are anticipated.
- Delivery – the nature of works required for this option is typical of road tunnel construction in Sydney and therefore provides minimal constructability, deliverability and risk issues compared with the other options.
- Transport efficiency – similar to options C and D, this option offers an increase in the capacity of the corridor, providing flexibility for managing changes in predicted future traffic growth.
- Achieving government strategy – the increased capacity provided by the additional tunnel supports future growth in transport demand along the M5 Corridor and would encourage further opportunities

**STAGE 6: OPTIONS ASSESSMENT**

to unlock land use potential.

Following on from the REA for the selection of the preferred strategic option, further economic assessment was undertaken to refine this option, to assess the interaction with other potential motorway, assessment of traffic volumes for varying tunnel configurations and for sensitivity analysis on key parameters such as tolling.

The refinement process identified that while the preferred strategic option provides additional capacity on the M5 Corridor, it also increases demand on the surrounding network, that has limited ability to cater for such increases and further impacts on access to key centres. To balance demand across the road network and facilitate greater interaction between the preferred strategic option and the existing road network, a number of concepts and further refinements were investigated. These further refinements included the development of a South Sydney connection. The preferred strategic option with these refinements constituted the indicative preferred option.

The outcomes from the appraisals, specifically after the inclusion of the South Sydney connection, indicated that, although the benefit cost ratio for the project had reduced, the direct user benefits have increased. This increase in user benefits result from improved travel times across the network, although more specifically significant benefits accrue through the improved traffic flow along the M5 Corridor and predicted reduction in traffic congestion on General Holmes Drive, Marsh Street/Airport Drive and Princes Highway. The reduction in traffic, and subsequent reduction in congestion, assists to improve access to Port Botany and Sydney Airport and provides opportunities to realise the potential economic, social and environmental benefits that can be accrued from the growth of these key centres.

The majority of the economic benefit that flows from the preferred option is derived by road users who receive travel time benefits as a result of increased capacity, reduced congestion and the extension of motorway conditions on the road network. These improvements to the network result in approximately \$6 billion of travel time savings over the 30 year assessment period, along with lower vehicle operating costs, achieved through less stop start traffic and improved flows.

In summary the following indicative preferred option was considered to represent the most feasible solution to improve the operational capacity of the M5 Corridor:

*M5 South West Motorway*

Widening to provide three lanes in westbound direction between King Georges Road to Camden Valley Way and in the eastbound direction between Camden Valley Way, Prestons and Fairford Road, Padstow.

*M5 East Freeway*

Duplication from King Georges Road, Beverly Hills to Cooks River, Mascot:

- Providing a new, four-lane westbound tunnel, provided as either a single four lane tunnel or twin two lane tunnels, with entry and exit portals in the vicinity of the existing tunnel portals.
- Providing four lanes in the eastbound direction by maintaining the existing eastbound tunnel and converting the existing westbound tunnel to eastbound.
- Retaining two lanes in each direction from the Marsh Street portals to General Holmes Drive, the existing eastbound tunnel ramps to Princes Highway and Marsh Street and on-load ramps from Marsh Street to the westbound tunnel.

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- Providing two lanes in each direction from the Marsh Street tunnel portals to the new South Sydney connection.
- Widening to four lanes in each direction the existing M5 East Freeway from the Bexley Road portals to the King Georges Road entry and exit ramps.
- Providing three lanes in each direction under King Georges Road, Beverly Hills.
- Widening Marsh Street to generally three lanes in each direction between the tunnel portals and Airport Drive.

A new South Sydney connection from the M5 East Freeway, Arncliffe to Euston Road, Qantas Drive and Gardeners Road, Mascot, comprising:

- A new surface and elevated road with two lanes in each direction along the proposed F6 corridor.
- Single lane ramps to provide access between the South Sydney connection and Airport Drive.
- A signalised intersection at the junction of the South Sydney connection and Campbell Road to access Gardeners Road via Bourke Road.

In delivering this preferred option, strong alignment with the National Goals is critical to achieving an infrastructure solution that produces the widest possible economic, social and environmental benefits. As such synergies between National Goals and how the indicative preferred option addresses these goals are summarised below:

*Increased economic standards of living for Australians.*

- Improves access to Port Botany and Sydney Airport.
- Caters for existing and future transport demand in the M5 Corridor.
- Reduces congestion in the M5 Corridor and on surrounding arterial network.
- Improves travel times for individuals and businesses using the corridor.
- Delivers a high quality, well-integrated and reliable transport network that supports economic development.
- Supports the prosperity and economic productivity of Sydney as Australia's only global city.

*Environmental sustainability and reduced greenhouse gas emissions.*

- Reduces greenhouse gas emissions from vehicles.

*Better social outcomes, quality of life, and reduced social disadvantage in our regions.*

- Enhances access to health, education and leisure facilities.
- Caters for demand for trips that are not well served by public transport.
- Reduces congestion on the road network in the M5 Corridor and surrounding arterial network.
- Improves travel times for individuals and businesses using the corridor.

Please refer to Section 6, as well as Appendix D and E of the Preliminary Overview Report for further details on the multi-criteria analysis and economic and financial analysis.













DELIVERABILITY ASSESSMENT

2. Is there a need for government funding?

Tolling

There is an applicable use pays market, namely tolling.

Existing tolling arrangements on the Sydney Motorway Network operate as a de facto road pricing scheme.

The M5 East Freeway and the M5 South West Motorway both form part of the Sydney Orbital Network. The M5 East Freeway is an untolled section connecting the M5 South West Motorway and General Holmes Drive.

The M5 South West Motorway is a tolled section connecting the M5 East Freeway and the M7 Motorway. The current toll charges are \$3.80 for smaller vehicles ("cars") and \$8.20 for larger vehicles ("trucks"). There is a cashback scheme which refunds tolls paid by non-business users.

The concession on the M5 South West Motorway is currently due to expire in 2023, however there is a potential for the concession term to be extended as part of the widening proposal.

An ultimate strategy for Sydney Motorways would be to apply cashless distance based tolling, and potentially time of day differential tolling, across the entire motorway network. This strategy embodies formalising and extending the existing de facto road pricing scheme so as to influence the overall travel demand, mode split and the distribution of traffic at different times and on different routes.

If The M5 East Freeway is to be tolled in the future, then the appropriate time to commence tolling would be at the completion of the M5 East Expansion.

The M5 East Expansion has been tested using distance based toll changes (pricing mechanism) where "cars" are charged 33 cents per kilometre and "trucks" 83 cents per kilometre (i.e. 2.5x cars) in 2008 dollars. This distance based pricing is in line with the successful M7 project but is significantly less than recent urban tunnel toll rates (i.e. compared to Cross City Tunnel \$1+ per km and Lane Cove Tunnel approx 60 cents per km).

Traffic modelling has demonstrated that:

- The South Sydney connection is sensitive to tolling. The network benefits of the South Sydney connection would not be realised were this connection tolled, as traffic would remain on the existing arterial routes.
- Tolling the M5 East duplication and not the South Sydney connection would result in desirable forecast traffic volumes in the corridor and on the wider road network.
- An untolled M5 East tunnel would result in traffic volumes reaching capacity by 2026.

A preliminary assessment of the impact of tolling on public transport in the corridor has been undertaken. Transport modelling by the Transport Data Centre showed that a tolled or an untolled option had little effect on bus and rail passenger trips.

Private Sector Funding from Tolls

Private sector investment is a potential source of funding for the M5 East Expansion.

The financial analysis performed on the project demonstrates that the M5 East Expansion could not be fully funded through the charging of tolls. A very significant Government contribution of some \$3.1 billion or more than 75% of the capital cost would be required.

The Government contribution quoted above does not include provision for a cashback type scheme on the M5 East Expansion. In the event that such a scheme were to be implemented on the M5 East

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Expansion then there would be an equivalent annual increase in Government contribution required to fund such a scheme.

Given the relatively high forecast government contributions, there is a requirement to consider alternative funding options which include a government toll road and tender by way of availability charge to spread the cost to government over the concession period.

It is anticipated that funding for the M5 East Expansion may come from a number of sources – the Federal Government, the NSW Government and the private sector. The balance of funding sources needs to be agreed between the Federal and NSW Governments in the context of other transport and infrastructure initiatives.

### Market for Private Capital Provision

There has historically been a competitive market for the provision of private capital for conventional toll road projects given the relatively stable cash flows with increases in toll rates (and therefore profitability) linked to CPI. This type of cash flow is looked upon very favourably by investors with longer term investment horizons (like super funds and foreign wealth funds).

In addition toll roads which do not have significant initial traffic and ramp up risks are looked upon very favourably by pension funds where their payment obligations are linked to CPI and therefore the investment returns match their liabilities.

In recent years the competitive market became overheated due to the availability of large volumes of inexpensive capital. This led to a series of green field toll road projects where the financial forecasts, primarily traffic forecasts, have proven to be overly optimistic leading to losses by equity providers and a flow on reduction in equity appetite for green field toll road assets.

More recently, the global shortage of debt finance has resulted in limitations on the availability of private capital for infrastructure projects.

It is envisaged that these issues will correct over time and that the short term negative outlook will resolve itself when there is ability to focus on the strong cash flows toll roads generate.

### Government Funding Objectives

Significant government investment in transport infrastructure in the M5 Corridor is required to meet the current and future travel demand associated with the planned development and growth of Sydney.

The M5 East Expansion will help to create competitive international gateways by developing land transport systems which compliment the expansion of Port Botany and Sydney Airport to cater for predicted increases in imports and exports.

This investment in landside infrastructure is critical to Australia's economic growth, Sydney's ongoing success as a global city in the Asia-Pacific Region and its prominence for the nation.

The existing arterial road network around the M5 Corridor is operating at or near capacity during peak periods and for much of the day. This is leading to severe levels of congestion on key parts of the transport network, which results in significant costs to individuals, businesses and the environment.

In view of the inextricable link between transport infrastructure and economic development and productivity, these costs are impacting on the NSW and Australian economies, as well as on the prosperity and competitiveness of Sydney.



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It is anticipated that this situation will be compounded by substantial increases in existing and future travel demand generated by passenger and freight growth at Sydney Airport and Port Botany and by planned and significant intensification of residential and employment land uses, particularly in existing urban areas along and surrounding the M5 Corridor.

Supporting Information and Documentation

- Tolling – Preliminary Overview Report Section 7.3
- Financial Assessment – Preliminary Overview Report Section 8.8 and Appendix E
- Government objectives – Preliminary Overview Report Section 4 and Appendix A

**DELIVERABILITY ASSESSMENT**

3. Is there a need for Commonwealth funding?

The M5 Corridor west plays a key role in the national transport system. It provides a direct link between the key centres of Port Botany/Sydney Airport with the freight distribution centres located in south western and western Sydney and the AusLink National Network along the eastern seaboard of Australia.

The M5 East Expansion contributes in a significant way to the National Goals and Strategic Priorities:

Performance against National Goals:

- Increased economic standards of living for Australians:
  - Improves access to Port Botany and Sydney Airport.
  - Caters for existing and future transport demand in the M5 Corridor.
  - Reduces congestion in the M5 Corridor and on surrounding arterial network.
  - Improves travel times for individuals and businesses using the corridor.
  - Delivers a high quality, well-integrated and reliable transport network which supports economic development.
  - Supports the prosperity and economic productivity of Sydney as Australia's only global city
- Environmental sustainability and reduced greenhouse gas emissions.
  - Reduces greenhouse gas emissions from vehicles.
- Better social outcomes, quality of life, and reduced social disadvantage in our regions.
  - Enhances access to health, education and leisure facilities.
  - Caters for demand for trips that are not well served by public transport.
  - Reduces congestion on the road network in the M5 Corridor and surrounding arterial network.
  - Improves travel times for individuals and businesses using the corridor.

Performance against National Strategic Priorities

- Expand Australia's productive capacity:
  - Provides the necessary infrastructure to support the intensification and agglomeration of employment lands along the M5 Corridor and growth of Port Botany and Sydney Airport that are major contributors to the Australian economy.
- Increase Australia's productivity:
  - Increases the productivity of Australia through
    - Improved transfer of freight from Port Botany and Sydney Airport to the logistic centres in the Western Sydney.
    - Improved distribution of goods from the logistic centres and intermodal terminals at Enfield and Moorebank to the wider Sydney area.
- Diversify Australia's economic capabilities:
  - Increases opportunities to encourage diversification of Australia's economy by:
    - Improving connectivity between major importing centres such as Port Botany and Sydney

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Airport that can deliver a wide range of goods for various commercial entities.

- Improved access through reduced travel times between importing centres and growth centres such as the Western Sydney Employment Hub and the South West Growth Centre.
- Build on Australia's competitive advantage:
  - Increases capacity that will support Australia's global competitive advantage by improving the efficiency of access to key centres within the M5 Corridor and across broader Sydney by:
    - Supporting the predicted future development of Port Botany and Sydney Airport.
    - Improving access by providing high quality transport links to freight distribution and warehousing centres.
    - Improve connectivity to markets along the eastern seaboard by improving access to the National AusLink Network.
    - Improved access from Western Sydney and Sydney Airport to the Global Economic Corridor.
- Develop Australia's cities and regions:
  - Provides an efficient and well functioning transport network that will encourage continued growth in population and trade in and between the key centres. The expansion will also provide opportunities for improved:
    - Social equity through access to jobs and services, higher property values and greater social inclusion.
    - Urban form.
    - Employment distribution for local populations.
    - Access to and from Sydney Airport.
- Reduce greenhouse gas emissions:
  - Removing the existing congestion problem has the potential to half the output of greenhouse gas emissions from vehicular emissions.
- Improve social equity and quality of life in Australia's cities and regions:
  - Improves community wellbeing, as commuters will receive travel time benefits from the expanded capacity. It will also provide improvements to social capital and quality of life by:
    - Reducing noise and improving air quality.
    - Reducing encroachment of vehicles onto the surrounding surface arterial road network.
    - Maintaining current access to local businesses.
    - Increasing opportunity for promoting pedestrian and cycle facilities.
    - Lowering vehicle operating costs.
    - Lowering crash rates.
    - Increasing labour force productivity and participation.
- Improving connectivity between residential areas and centres of community and leisure activity.

**DELIVERABILITY ASSESSMENT**

Existing Funding

The Federal Government has provided \$5 million and the NSW Government has provided \$10 million to fund the M5 Transport Corridor Feasibility Study.

No further funds were allocated in the 2009 Federal and State budgets.

Expenditure up to 30 June 2009 was \$3.3 million. Sufficient funds remain available to proceed to environmental assessment and planning approval of the M5 East Expansion.

Future Funding Scenarios

It is anticipated that funding for the M5 East Expansion may come from a number of sources – the Federal Government, the NSW Government and the private sector. The balance of funding sources needs to be agreed between the Federal and NSW Governments in the context of other transport and infrastructure initiatives. Likely scenarios are:

Scenario 1: Government Capital Provision

- The cost of the project is fully funded by Governments.
- Tolling can be applied and Government retains control of the tolling.
- Fast tracking the delivery of the project is possible subject to funding.
- NSW would be seeking Federal funding of a major contribution towards the project capital cost of \$4 billion in 2008 dollars.

Scenario 2: Availability PPP

- The cost of the project is partly funded by Government and partly funded through private sector finance repaid by annual availability payments.
- The level of the up front cost to Government is set to ensure that the scale of the private sector financing is acceptable and to limit the availability payments to an appropriate level.
- Tolling can be applied. Government retains control of the tolling and accepts patronage risk.
- The delivery cannot readily be fast tracked.
- NSW would be seeking Federal funding of a major share of the up-front cost to Government, likely to be \$2 to \$3 billion in 2008 dollars.

**DELIVERABILITY ASSESSMENT**

4. Does the delivery strategy provide confidence that the project benefits will be delivered?

Delivery Strategy

The planning work currently being undertaken and specifically the environmental assessment allow for delivery of the project by a number of different procurement options ranging from using a privately funded PPP contract to a fully government funded alliance contract.

Procurement via a PPP using private finance (albeit with a significant government contribution) would reduce the up front cost to Government and transfer maximum risk to the contracting party, but it would also incur a longer overall delivery time.

Procurement via a fully government funded alliance contract would reduce timeframes by enabling the early engagement of a private sector D&C partner and progression of environmental assessment and project development in parallel with design and construction planning. Government would retain a greater proportion of risk with this approach.

The final procurement model will be selected to suit the funding arrangements.

Each different procurement option includes appropriate methodologies to create the right incentives on all parties, allocate risks to those best placed and incentivised to manage them, align ownership and leasing with risks and incentives and ensure that the ownership structure drives delivery and operational efficiencies.

It is proposed that the NSW Roads and Traffic Authority as the key stakeholder would manage the construction, operation and maintenance of the project on behalf of the Federal and NSW governments.

RTA has delivered eight significant road infrastructure projects through PPP procurement agreements over the past 20 years. This achievement demonstrates a proven capability, contractual maturity and experience which, if a PPP model is adopted, will be critical to the successful governance of this project.

It should be noted that PPP delivery policies in NSW are constantly being reviewed and improved to incorporate lessons learned on previous projects and in response to construction industry feedback, public submissions and current financial market conditions.

RTA also has an extensive track record of successful delivery of significant infrastructure projects through other procurement methods including Design and Construct, Design Construct & Maintain and alliance contracts.

Operation and Maintenance Strategy

Each different procurement option includes arrangements for the operation and maintenance of the M5 East Expansion following construction.

Procurement via a PPP would see operation and maintenance of the infrastructure included in the contract for the concession term.

Procurement via a fully government funded procurement model would likely see the RTA entering into a 10 year operation and maintenance contract.

The fundamental operation and maintenance requirements are the same in either case.

Indicative Preferred Option

The M5 Corridor feasibility study commenced in July 2008 and undertook a number of investigations as part of the development, assessment and evaluation of strategic options for improving the corridor.

**DELIVERABILITY ASSESSMENT**

The M5 Corridor Feasibility Study Preliminary Overview Report (the Preliminary Overview Report) was completed in May 2009, which identified a preferred option for expanding the corridor. The report concluded that the preferred option met the study objectives and represented a feasible solution to improving the operational capacity of the corridor.

The preferred option has been endorsed by the NSW Cabinet.

The preferred option can be broadly divided into two parts. The first is the widening the M5 South West Motorway from Prestons to Beverley Hills. The M5 South West Motorway is leased and operated by Interlink Roads Pty Ltd, and RTA is in negotiations with Interlink to deliver the widening as a Deed of Variation under the existing agreement.

The second part is the M5 East Expansion, which includes the duplication of the M5 East Freeway from Beverley Hills to Arncliffe and the provision of a new South Sydney connection from Arncliffe to Mascot and St Peters. It is this project which is the subject of this submission to Infrastructure Australia.

Key Milestones

- Environmental Assessment      Jan 2010 to Mar 2011
- Planning Approval                      Late 2011

Based upon assumed commitment to funding the delivery of the M5 East Expansion, the procurement process could commence in early 2011 with construction occurring between early 2013 and late 2016.

Supporting Information and Documentation

- Procurement and delivery – Preliminary Overview Report Section 8.9
- Operation – Preliminary Overview Report Section 8.5
- Indicative preferred option – Preliminary Overview Report Section 9
- Feasibility assessment – Preliminary Overview Report Section 8

DELIVERABILITY ASSESSMENT

5. Does the project governance model provide confidence that the project benefits will be delivered?

Governance Arrangements

The M5 Corridor study has been developed under the governance of a Steering Committee comprising CEOs/Directors from key Federal and State Government agencies including:

- The NSW Coordinator General (Chair).
- The Federal Department of Infrastructure, Transport, Regional Development and Local Government (DITRD LG).
- NSW Treasury.
- NSW Ministry of Transport.
- NSW Centre for Transport Planning and Product Development.
- Sydney Metro.
- Roads and Traffic Authority of NSW (RTA).
- NSW RailCorp.
- Transport Infrastructure Development Corporation.
- NSW Department of Planning.

Management and reporting arrangements are also in place between RTA and DITRD LG for all projects with funding from the Building Australia Fund. These arrangements apply to the M5 Corridor study.

It is proposed to form a new Steering Group of appropriate representatives to provide governance for the next phase of planning for the M5 Corridor Expansion, potentially chaired by the Director General, NSW Department of Transport & Infrastructure. The ongoing involvement of senior Federal Government representatives will also be sought.

Project Review

A review has been undertaken to determine compliance of the Preliminary Overview Report with the study terms of reference and scope statement.

Ongoing project review will be undertaken in line with the requirements of the new Steering Group.

Supporting Information and Documentation

- West Metro and M5 Transport Corridor feasibility studies – Terms of reference.
- M5 Transport corridor feasibility study scope statement.
- M5 Transport Corridor Study Review of methodology, scope and findings  
Environmental Management Outcomes, September 2009.



# Appendix B

## SUPPORTING DOCUMENTS AND REFERENCES

### Supporting Documents

The following Cabinet-in-confidence supporting documents are included in this submission:

- M5 Transport Corridor Estimate Report  
Mark Raven Consulting, 1 October 2009
- M5 East duplication (tolled) with four lane westbound tunnel and South Sydney connection (untolled) with link to Qantas Drive, Economic Model  
Roads and Traffic Authority of New South Wales, 12 October 2009
- M5 East duplication with four lane westbound tunnel and South Sydney connection with link to Qantas Drive (all untolled), Economic Model  
Roads and Traffic Authority of New South Wales, 12 October 2009
- M5 Expansion – estimation of economic loss from project delay, Economic Model  
Roads and Traffic Authority of New South Wales, 12 October 2009
- M5 Corridor Expansion Phase 1 Pre Environmental Assessment Consultation  
Manidis Roberts, draft October 2009
- West Metro and M5 Transport Corridor Feasibility Studies Terms of Reference  
M5 and West metro Transport Studies Task Force, August 2008
- M5 Transport Corridor: Feasibility Studies Scope Statement  
M5 and West metro Transport Studies Task Force, August 2008
- M5 Transport Corridor Study Review of methodology, scope and findings  
Environmental Management Outcomes, September 2009
- M5 Transport Corridor Study Preliminary Overview Report  
Roads and Traffic Authority of New South Wales, May 2009
- M5 Transport Corridor Needs Background Paper  
NSW Ministry of Transport, October 2008