



**Infrastructure
Australia**

Infrastructure Australia

Project Business Case Evaluation

Project name	WestConnex
Rating	High Priority Project
Date of IA Board rating	April 2016

Location	Sydney, NSW
Proponent	NSW Government
Project timeframe	Construction from 2015-2023, including: <ul style="list-style-type: none">• Stage 1 (Parramatta to City West Link): Planning 2014-2015, Construction 2015-2019• Stage 2 (Beverly Hills to St Peters): Planning 2013-2017, Construction 2016-2019. The 'Sydney Gateway' is also part of Stage 2, with an indicative timeline for completion by 2023• Stage 3 (City West Link to St Peters): Planning 2015-2018, Construction 2018-2023

Evaluation Summary

The *Australian Infrastructure Audit* (the Audit) projected that, in the absence of interventions to address the problem, the cost of congestion in the Sydney/Newcastle/Wollongong area would more than double from \$5.6 billion in 2011 to \$14.8 billion in 2031. The Audit noted that a number of corridors in Sydney's inner west are severely congested now, and that this will deteriorate over the immediate and longer term.

WestConnex would increase capacity on Sydney's road network, extend the motorway network and directly connect the strategically significant M4 and M5 Motorways. It also aims to improve connectivity to the international gateways of Kingsford Smith Airport and Port Botany. A substantial component of WestConnex is under construction or has been contracted.

Infrastructure Australia has reviewed a number of earlier business cases as the WestConnex program has developed, including a submission in October 2012, a July 2013 business case, a revised cost-benefit analysis in 2014 and a revised business case in 2015 that includes further revision to the cost-benefit analysis. A redacted version of the 2015 business case (the subject of this assessment) has also been made public. The revised submissions have addressed Infrastructure Australia's previously noted concerns about ensuring connectivity to the airport and port, and the need to model the impact of induced demand.

The benefit-cost ratio for WestConnex as a whole stated by the proponent is 1.7 (excluding wider economic benefits) and 1.9 (including wider economic benefits). Based on sensitivity analyses undertaken by the proponent, Infrastructure Australia is confident the benefits of the project in its entirety will exceed the costs. The benefit-cost ratio for the project has fallen marginally compared to the 2014 submission, from 1.8 to 1.7, because of changes to both benefits and costs.

Allowing for induced demand has reduced estimated benefits by about 25%, which is partially offset by changes in the calculation of vehicle operating cost savings, in accordance with revised national guidelines. The costs used in the economic analysis for the current business case are similar to those from the 2014 submission. However, the costs have increased by \$2 billion between the 2013 business case and 2015 business case, reflecting additional costs for Sydney Gateway and realignment of Stage 3 to Anzac Bridge, Victoria Road and connectivity for a future Western Harbour Tunnel.

Stage 1, which extends and widens the M4, and Stage 2 (excluding Sydney Gateway), which provides a new M5 tunnel, are under construction or contracted. While some benefits will be realised by Stages 1 and 2, the broader benefits of the WestConnex program begin to accrue only upon completion of Stage 3, which connects the extended M4 and M5. As a result, unless Stage 3 is delivered, the full benefits of the project will not be realised and the value for money of investments already made on Stages 1 and 2 will be diminished.

WestConnex was the major priority project put forward in Infrastructure NSW's 2012 *State Infrastructure Strategy*. The Strategy employed a multi-criteria prioritisation framework to decide between infrastructure options. Infrastructure Australia believes a more robust analysis would have seen WestConnex considered against, and in conjunction with, a broader set of options for addressing Sydney's longer term transport needs. The design for WestConnex has evolved from the original business case, and the cost of the project has increased. A more comprehensive options analysis may have identified these evolutions or other approaches earlier in the planning and delivery process, potentially mitigating some risks around project certainty and scope.

Infrastructure Australia supports the proponent's intention to use tolling to fund a significant proportion of the costs of the project.

Context and Problem Description

1. Strategic context

Congestion in Sydney is a nationally significant problem imposing considerable costs on the economy and the community. The Audit projected that, in the absence of interventions to address the problem, the cost of congestion in the Sydney/Newcastle/Wollongong area would more than double from \$5.6 billion in 2011 to \$14.8 billion in 2031. The Audit noted that a number of corridors in Sydney's inner west are severely congested now, and that this will continue to worsen into the future:

- The King Georges Road corridor from the Princes Highway to the M4 was ranked the 2nd most congested in Greater Sydney in 2011;
- The broad corridor from Parramatta to the City West Link included the 7th, 8th and 9th most congested corridors in 2011; and
- The M5 was the 11th most congested corridor in 2011.

WestConnex was the major priority project put forward in Infrastructure NSW's 2012 *State Infrastructure Strategy*, and was subsequently identified in the NSW Government's *Long Term Transport Master Plan* as an immediate priority in a longer term vision to complete the critical links in Sydney's motorway network.

Submissions received from the WestConnex project since 2012 indicate that the problems sought to be addressed by the project have changed in scope. As a consequence, the scope of the project has evolved. Scope additions since 2012 include greater connectivity to Port Botany and future connections to the proposed Southern Connector and across the harbour. The evolution of the project's scope emphasises the importance of comprehensive problem definition and long-term planning in order to mitigate cost, scope and stakeholder engagement risk.

2. Problem description

WestConnex addresses problems of congestion and connectivity for the Parramatta Road corridor, the M5 corridor and the north-south corridor between the M4/Parramatta Road and the M5. The problems identified by the proponent are:

- Congestion: tackling transport underperformance to improve travel reliability, reduce the frequency of road traffic incidents, reduce vehicle emissions and traffic noise, and improve community well-being;
- Poor connectivity for communities: improving access to employment and services for residents from Sydney's west and south-west, while catalysing renewal along key corridors, especially Parramatta Road; and
- Poor connectivity for business: supporting economic growth by improving connections between Western Sydney and the Global Economic Corridor and supporting freight, service and business movements across the city and the state.

The project addresses a nationally significant problem, in the form of congestion and travel delays for Sydney's road users.

Project description

3. Project overview

WestConnex is a program of interconnected road projects that involves:

- Stage 1: Widening the existing M4 Motorway and extending the motorway from Strathfield towards Sydney's inner-western suburbs (13.8 kms, including a 5.5 km tunnel);
- Stage 2:
 - Widening the M5 (surface section east of Kings Georges Road) and duplicating the tunnels to St Peters (11 km, including a 9 km tunnel); and
 - 'Sydney Gateway' – a number of proposed road improvements between an interchange at St Peters and the Airport precinct, which would also provide some improvement in access to Port Botany; and
- Stage 3: Linking the two motorways with a new tunnel under the inner western suburbs of Sydney (9.2 km tunnel).

The proponent's objectives for WestConnex are to:

- Support Sydney's long-term economic growth through improved motorway access and connections linking Sydney's international gateways and Western Sydney and places of business across the city;
- Relieve road congestion so as to improve the speed, reliability and safety of travel in the M4 and M5 corridors, including parallel arterial roads;
- Cater for the diverse travel demands on these corridors that are best met by road infrastructure;
- Create opportunities for urban renewal, improved liveability, public and active transport improvements along and around Parramatta Road;
- Enhance the productivity of commercial and freight generating land uses strategically located near transport infrastructure;
- Fit within the financial capacity of the State and Federal Government, in partnership with the private sector; and
- Optimise user pays contribution to support funding in a way that is affordable and equitable.

Since the initial 2012-13 submission to Infrastructure Australia, several stages of the project have advanced and substantial components of the project are under construction or contracted:

- The M4 widening was given planning consent, the delivery contract has been awarded, and construction began in March 2015;
- The M4 East delivery contract was awarded in June 2015. Planning approval for the tunnel was granted in February 2016. Major construction is expected to begin in mid-2016;

- The New M5 delivery contract was awarded in November 2015. The EIS for the New M5 came off public exhibition in late January 2016, and a post exhibition report has been submitted to the NSW Department of Planning and Environment;
- A contract for operation and maintenance of Stages 1 and 2 was awarded in December 2015;
- The King Georges Road Interchange upgrade has been given planning consent, the delivery contract has been awarded and major construction began in July 2015; and
- Major work on the New M5 is expected to commence in mid-2016.

Business Case and Economic Evaluation

4. Options identification and assessment

WestConnex was viewed as a priority by Infrastructure NSW because:

- Investment in Sydney's road networks was viewed as being best able to service diverse travel needs;
- The M4/Parramatta Road and M5 are facing high demand, impacting average speeds; and
- The M4/Parramatta Road and M5 are the most important road routes for freight and business transport and for connection to the 'gateways' at Port Botany and Kingsford Smith Airport.

The 2012 *State Infrastructure Strategy* employed a multi-criteria prioritisation framework (as opposed to a more detailed assessment) to assess options to address the problems identified above. Infrastructure Australia believes a more comprehensive analysis would have seen WestConnex considered against, and in conjunction with a broader set of options for addressing Sydney's longer term passenger and freight transport needs.

The design for WestConnex has evolved from the original business case, including by providing greater optionality for additional road connections including the Western Harbour Tunnel and improved connectivity from WestConnex to Sydney Airport and Port Botany. A more systematic options analysis may have identified these evolutions (or other approaches) earlier in the planning and delivery process, potentially mitigating some risks around project certainty, scope and cost.

The refinement work undertaken suggests that there are significant benefits from the completion of the full WestConnex program. Partial delivery of WestConnex provides substantially lower economic returns than delivery of the full program. This supports the prioritisation of WestConnex as a single concept by Infrastructure NSW.

5. Economic evaluation

The NSW Government's stated BCR for the total project is 1.9 including wider economic benefits (WEBs). Without WEBs, the stated BCR is 1.7.

The BCR for particular segments of WestConnex is lower than for the entire project, as stages are complementary to one another. This means that benefits are mainly realised from 2023 onwards, following the completion of the entire program. Failure to complete Stage 3, which connects the M4 and M5, or any delays to its completion, will therefore have significant impacts on the economic merits of the program.

A critical consideration in tollway projects is the response of drivers to paying tolls. Traffic modelling for WestConnex has drawn upon project-specific surveys of the potential responses of private and commercial drivers to road tolls. The overall approach to the modelling was also peer-reviewed. The surveys and peer review provide some assurance about the potential demand projections. However, experience on other Australian tollway projects has shown that actual traffic levels can differ appreciably from estimates prepared at the time a project is first investigated.

The estimated benefits of the project are currently 70% higher than the estimated costs, excluding WEBs. The main changes from the review undertaken by Infrastructure Australia in 2014 is that induced traffic has been modelled, as recommended by Infrastructure Australia in its previous assessment, and project scope has increased. The analysis indicates that allowing for induced traffic reduces the present value of benefits by approximately 25%. A number of other changes have been made from the 2014 assessment, particularly related to estimating vehicle operating cost savings and greenhouse gas emissions that partly offset the impact of allowing for induced demand. Based on a

review of the November 2015 business case, Infrastructure Australia is confident the project in its entirety will have net benefits. Sensitivity tests for substantial increases in capital and operating costs indicate that the BCR remains higher than 1.

There are some areas where benefits for the project could be overstated, or understated. Areas where benefits could be overstated include the annualisation factor used in the analysis to convert weekday traffic estimates to yearly estimates that take account of weekends and public holidays, the methodology for estimating vehicle operating costs, and the high share of travel time benefits accruing to business travel. An area where benefits could be understated is in urban renewal, where costs for urban renewal are included but not consequential benefits. Overall, Infrastructure Australia is confident that benefits for the entire WestConnex project will exceed costs.

Given that Stage 1 and Stage 2 are under construction or contracted, failure to complete Stage 3, or any delay to its completion, would have a materially adverse impact on the economic results.

Cost estimates provided for Stage 3 and the Sydney Gateway are estimated on a P50 basis. Infrastructure Australia guidelines request cost estimates on a P50 and P90 basis for use in cost benefit analysis. The cost estimates underpinning the economic evaluation are based on, among other things, the contracted prices for Stage 1 and tendered price for Stage 2, which together comprise over half of capital costs. Infrastructure Australia considers that there remain material risks associated with costs for Stage 3 and Sydney Gateway, including challenges with construction in the vicinity of Sydney Airport and risk around ground conditions for the Stage 3 tunnelling.

Major cost items

- Capital costs: \$16.8 billion (nominal) made up of:
 - Stage 1: \$4.3 billion
 - Stage 2: \$4.5 billion
 - Sydney Gateway: \$0.8 billion
 - Stage 3: \$7.2 billion
- Operating costs: The operating costs are commercial-in-confidence.

Total capital cost (nominal, undiscounted)	\$16.8 billion (P50)
Proponent's proposed Australian Government funding contribution (nominal, undiscounted)	\$1.5 billion grant provided for Stage 1 \$2.0 billion loan for Stage 2.
Other funding (source / amount / cash flow) (nominal, undiscounted)	Commercial-in-confidence

Major sources of benefit

- Travel time savings (\$12.9 billion net present value, 58% of core benefits, i.e. not including wider economic benefits);
- Vehicle operating cost savings (\$6.2 billion net present value, 28% of core benefits);
- Improvements in travel time reliability (\$1.5 billion, 7% of core benefits);
- Other (residual value, crash costs and environmental benefits) (\$1.7 billion, 7% of core benefits); and
- Wider economic benefits for agglomeration and additional tax revenues from increased labour supply (\$2.1 billion, adding 10% to core benefits).

Deliverability

The delivery of WestConnex is being undertaken in three stages, as set out above. The Sydney Motorway Corporation is overseeing the delivery of WestConnex. The private sector will undertake construction works for the project. The widening of the M4, M4 East, King Georges Road intersection upgrade and new M5 tunnels have been contracted.

It is expected the project will be initially financed by the NSW Government with Australian Government assistance and private debt finance, and then sold to the private sector as a tolled concession.

The two main risks to the delivery of benefits from WestConnex are:

- Failure to complete or delays to Stage 3. In the absence of this connecting tunnel, benefits would be substantially lower, and the project as a whole may not have net benefits at a 7% discount rate.
- Demand risk, both upside and downside:
 - o Substantial increases in traffic in excess of that modelled because of the project (or other projects) that compromise the performance of the motorway. This could be managed with pricing solutions, such as network-wide pricing.
 - o Lower than expected demand, including in response to tolling arrangements, which may lead to better traffic performance on WestConnex itself but smaller benefits for other untolled roads.

Other information

WestConnex could facilitate urban renewal and improved public transport along the Parramatta Road corridor. Given the corridor's location between the two largest centres within Sydney, it is especially important that land use opportunities are maximised.

These matters are being investigated by UrbanGrowth NSW and Transport for NSW. Infrastructure Australia supports the NSW Government's intentions to encourage greater development and urban renewal along the Parramatta Road corridor as part of the project's outcomes. The NSW Government's draft *Parramatta Road Urban Transformation Strategy* indicates that the Parramatta Road corridor could support an additional 40,000 dwellings (housing 70,000 people) and businesses providing 50,000 jobs.

The *Australian Infrastructure Plan* noted that Sydney's population is projected to grow by approximately 3.5 million people between 2016 and 2061. In light of this growth and the corresponding need for new housing, further consideration of redevelopment opportunities along this corridor is warranted.

Improving public transport along Parramatta Road (particularly at its eastern end) will require careful and focused attention by the NSW Government, e.g. on measures to ensure that the available road space, and related traffic systems, are managed to support the operation of reliable public transport services. Realisation of these land use and public transport benefits will require ongoing work.

This evaluation summary was considered by the Infrastructure Australia Board in April 2016.

Following Infrastructure Australia's process of fact checking the evaluation summary with the proponent prior to publication, the brief was amended to clarify:

- Construction of Stage 1 commenced in March 2015;
- P50 cost estimates relate to Stage 3 and Sydney Gateway.

Subsequent to the Board's consideration of the brief, the NSW Government gave planning approval for WestConnex Stage 2 on 21 April 2016.