Final Business Case Summary

Sydney Gateway

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About this report

Sydney Gateway is designed to increase transport capacity and connections between the Sydney transport network, Sydney Airport and Port Botany. It will do this by delivering new road and rail infrastructure. A motorway from St Peters to Mascot is proposed, together with road upgrades to provide improved access to Terminals 2 and 3 of Sydney Airport. The rail line between Mascot and Port Botany will be duplicated, with some realignment of the line and upgrading of existing rail infrastructure.

The Business Case for Sydney Gateway was developed by (Roads and Maritime Services) Transport for NSW and submitted to the NSW Government in October 2018. This Business Case Evaluation Summary has been prepared by Infrastructure NSW, the NSW Government's independent infrastructure advisory agency.

Strategic context

Growth in population and the economy

The Greater Sydney Commission's Plan for Sydney[1] describes a metropolis of three separate cities where residents of each city have easy access to jobs and services. The three cities are the Eastern Harbour City, Central River City and Western Parkland City.

By 2031, the economic output of Sydney is expected to almost double and it will maintain its role as one of the economic capitals of Australia. The transport network currently services a population of 4.8 million making a total of 15.5 million multi-modal trips each day. By 2031, Sydney's population is forecast to grow by around 1.6 million people and 0.7 million new jobs are forecast.

Complementing the Regional Plan for Sydney are five District Plans, developed to reflect the specific character and needs of the locations that make up each city.[2] Sydney Gateway sits within the Eastern City District, which generates over 45 per cent of Greater Sydney economic activity and includes Port Botany and Sydney Airport, the state's link to the international economy.

The importance of Port Botany and Sydney Airport

Sydney Airport and Port Botany are among the busiest and most important air and sea freight terminals in Australia. Together they are known as the State's trade gateways and generate over $10 billion of economic activity and handle close to $100 billion of freight[3]. As a result, efficient access to and from the trade gateways is critical to the broader NSW economy.

Growth in port volumes

Port Botany currently handles almost all the State's demand for container freight, worth approximately $65 billion[4]. The sea port will also continue to be the preferred destination for a range of other traded goods.

By 2036, container volumes at the sea port are forecast to double to 4.8 million (from approximately 2.4 million containers in 2017)[5]. Port volumes have increased rapidly over the past two decades (over six per cent per annum) due to economic and population growth[6]. These underlying trends are expected to continue.

Future Transport 2056[7] articulates transport planning to support the vision for Greater Sydney. It identifies Sydney Gateway as part of Sydney's strategic freight network.

The trend to intermodal terminals

The freight industry is responding to the growth in containerised trade with changes in where they store and unpack containers. They are moving from smaller distribution centres close to the sea port to larger multi-modal facilities in the outer western suburbs. These new facilities are typically

[1] Greater Sydney Commission *A Metropolis of Three Cities* (2018)

[2] Greater Sydney Commission (2018), *Eastern City District Plan; South District Plan; Western City District Plan; Central City District Plan; North District Plan.*

[3] Roads and Maritime Services (2018), Sydney Gateway Final Business Case (EY, 2011)

[4] Roads and Maritime Services (2018), Sydney Gateway Final Business Case (BITRE, 2018)

[5] Roads and Maritime Services (2018), Sydney Gateway Final Business Case

[6] Roads and Maritime Services (2018), Sydney Gateway Final Business Case (Sydney Ports, 1998)

[7] Roads and Maritime Services (2018), *Future Transport 2056.*

located on both the motorway and rail networks to assist in making the longer transport movement to and from the sea port as efficient as possible.

Growth in air travel

In addition to its role as a major air freight terminal, Sydney Airport is and will retain the role as the key gateway for tourists and business travel to Sydney and more broadly for international travellers accessing Australia. The growth in air travel to and from Sydney is anticipated to continue. By 2039, passenger trips to or from Sydney Airport are expected to grow to 66 million trips (from 43 million trips in 2016)[8], notwithstanding the planned opening of the Western Sydney Airport in 2026.

[8] Roads and Maritime Services (2018), Sydney Gateway Final Business Case (Sydney Airport, 2018)

Project need

There are a range of drivers which, over time, will further intensify the level of demand and congestion with transport movements in the Mascot area. The anticipated additional congestion around the airport and sea port, if not addressed, will also generate significant productivity impacts.

High volumes of traffic to the airport and sea port

The network of local roads around the precinct plays a key role in both accommodating the needs of a large and growing local population and in accommodating the needs of traffic accessing the airport and sea port. The through-movements are also expected to become more significant once WestConnex opens to traffic in 2023.

Lack of spare capacity on local roads

Without an investment in a new road link, journeys between the WestConnex St Peters Interchange, Sydney Airport and towards the sea port can only occur via a few highly constrained routes in Mascot town centre. These routes are characterised by narrow traffic lanes, short turning bays, single turning lanes, numerous turning movements, tight turning circles and short distances between multiple signalised intersections. The characteristics of these roads are also not well suited to the type of vehicles using them (including the heavy vehicles moving to the sea port).

Increasing competitiveness and efficiency of rail services

The single line section of the Port Botany freight rail line is a bottleneck in the broader freight rail network affecting the efficiency and reliability of the network today. If the line is not duplicated, it will impede the future growth in rail freight movements to Port Botany. The effect of this could be to diminish productivity gains by hampering the growth to/from Port Botany, Port terminal operators, rail operators and intermodal facilities to efficiently move freight accessing Port Botany.

Resolving future capacity constraints on the Port Botany freight rail line, when combined with planned major investments in the freight network, is expected to lead to efficiencies for users, consumers and the broader community. In relation to the broader community, the improved rail infrastructure offers the opportunity to remove some heavy vehicles that would otherwise use the road network.

Impact on Mascot town centre

Over the period 2011 to 2046, the number of houses in the Mascot town centre is forecast to grow from 1,050 to 6,650 and the number of jobs is expected to increase from 22,650 to 27,950[9]. This intensification of land uses will necessitate transport and planning initiatives which will allow the town centre to better meet the broader needs of the community. In particular, there is a need for a motorway link and freight rail upgrade which can divert some heavy vehicles and through-traffic away from residential areas.

These factors are leading to increased congestion on local roads in the precinct and volumes of passenger, freight and commuter vehicles will continue to grow. Road will remain the preferred travel mode for journeys to the airport and sea port. The ability of the existing road infrastructure to accommodate this demand is also expected to diminish once WestConnex is operational. The St Peters Interchange for WestConnex includes a new bridge over Alexandra Canal and continued

[9] Roads and Maritime Services Open Data, 2018

access via the local road network towards the airport and the sea port. Congestion is expected to be most pronounced on the roads which provide access to both these locations following the opening of WestConnex.

In order to meet these challenges, there is a need to address the following issues with the capacity of the transport network:

- **Issues with road infrastructure** – The location of the airport and the sea port represent a key challenge in terms of road infrastructure capacity. This is because they are located in a constrained road environment that does not offer sufficient capacity to provide reasonable levels of service or the ability to increase capacity with local road upgrades.
- **Issues with freight rail infrastructure** – the transport task associated with the projected growth in port volumes is significant with Port Botany being located in the east and the current and future freight activity precincts being located in the west.

Both the Australian and NSW governments have identified clear objectives to increase the share of freight being moved by rail to reduce demand on the surrounding road network. However, moving higher volumes by rail will place additional demands on the Port Botany freight rail line which is constrained by a section of single track between Mascot and Port Botany.

Project objectives and design

Objectives

Sydney Gateway will improve the efficiency of commercial and freight activity and deliver better outcomes for the wider travelling public. This includes the movement of private vehicles between the western and eastern parts of the metropolitan area and the movement of buses through the Mascot and Botany town centres.

The primary objectives of Sydney Gateway are:

- To improve connectivity to Sydney Airport terminals by providing motorway connections that will cater for forecast growth in passenger and air freight volumes
- To support the efficient distribution of freight between the Port Botany and Sydney Airport precincts and logistic centres in western Sydney
- To improve the liveability of Mascot town centre by reducing congestion and heavy vehicle movements through the local road network
- To support the forecast growth in containerised freight and rail market share by increasing rail capacity, operational efficiency and service reliability into and out of Port Botany on the Port Botany freight rail line.

Design

Sydney Gateway is comprised of two road elements; The **Motorway** and improved access to **Terminals 2/3 Access**

The **Motorway** provides new ramps and surface roads in the northern section of the Sydney Gateway project area. The new infrastructure will provide the following links:

- **St Peters Interchange Connection** – extends the Sydney motorway network at St Peters Interchange towards the two aforementioned road connections.
- **Terminal 1 Connection** – provides a direct link from the St Peters Interchange Connection towards Terminal 1 at Mascot
- **Qantas Drive Upgrade and Extension** – provides connectivity from the St Peters Interchange connection towards Mascot's key commercial activity centres – i.e. Terminals 2/3 and onto the sea port
- **Link Elements** – provides connectivity between Terminal 1 and Terminals 2/3 via a new alignment, which replaces Airport Drive as the existing east-west connection. The replacement of this section of road will assist in improving the height limitations imposed by the airport's airspace protection, on a permanent basis.

The improved access to **Terminals 2/3** will involve road upgrades in the southern part of the Sydney Gateway project area**.**

This package of works includes:

- Widening of Qantas Drive from the Motorway to Joyce Drive
- Providing new dual 'free flow' left turn arrangements out of Terminals 2/3
- Grade separating the south-bound vehicle entrance into the airport with a viaduct from Qantas Drive

- Providing off-ramps to different facilities within the Terminals 2/3 precinct.

The **Port Botany Rail Duplication** incorporates works between King Street, Mascot and Banksia Street, Botany. The rail scope includes construction of an additional track, realigning sections of the existing track, new bridges to accommodate the new track, replacing existing bridges and ancillary works in the area (e.g. service protection or relocation, signalling upgrades).

The Australian Government has recently committed funding which will be delivered by Australia Rail Track Corporation (ARTC) together with the separate Cabramatta Loop project. Together these projects will provide additional capacity and flexibility on the Metropolitan Freight Network.

Capital Cost

The total capital costs of the road components of Sydney Gateway is estimated to be between $2.2 and $2.6 billion. The analysis supporting the final business case was based on a cost with a P90 outturn cost estimate of $2.45 billion[10].

The project cost estimate for the Port Botany Rail Duplication and the associated Cabramatta Loop project is $400 million as announced by the Australian Government in May 2018. The project is not seeking a funding contribution from the NSW Government for either of these works.

[10] Actual construction cost at project completion.

Options identification and assessment

The alignment options for the **motorway connection** between the St Peters Interchange, the airport and the sea port was first examined in 2013 as part of the design development process for WestConnex. The option identification process has been driven by two factors:

1) the limited availability of suitable lands; and
2) the dual links to different airport terminals offering a range of commercial, operational and community benefits.

Due to the strategic nature of land use in the project area, suitable alignments are limited to either undeveloped land and/or existing transport corridors. In particular, there is a requirement for access to undeveloped sites controlled by Sydney Airport and Inner West Council in order to connect St Peters Interchange to the airport. These sites align with ramps currently being built for the Sydney motorway network at St Peters Interchange.

The alignment was also identified by the need for dual motorway links to Sydney Airport. The dual links would allow large numbers of vehicles to access different parts of the airport simultaneously and provide commercial and operational benefits to the airport and the sea port. Ongoing design work in relation to the form of bridges, location of bridge piers and the relocation or protection of utilities is being carried out by Transport for NSW. Furthermore, the Sydney Gateway team are exploring value engineering opportunities to reduce cost as the design matures and investigations provide additional details.

The operational requirements for the **Port Botany Rail Duplication** and likely construction interfaces were considered during the development of road design options. The interfaces are also critical from a rail capacity perspective: the road and rail works need to be completed concurrently so that the transport network can accommodate predicted demand from the Sydney motorway network at St Peters Interchange.

The need for upgrading selected parts of the Metropolitan Freight Network was recommended in the detailed capacity analysis contained in the *Sydney Metropolitan Freight Strategy*[11]*.* In particular, this document identified the need to address the single line section of the Port Botany freight rail line and a passing loop in Cabramatta. Investment in these parts of the existing rail network would offer the greatest opportunity to increase freight capacity while improving reliability and flexibility for freight operations.

[11] ARTC (2015) Sydney Metropolitan Freight Strategy - 2015-2024

Economic evaluation

An economic evaluation of the project was undertaken to support the final business case submission. This economic evaluation included an analysis of the economic, social and environmental impacts or benefits of the road project.

The Sydney Gateway road project is forecast to generate widespread positive impacts and benefits by reducing travel times, increasing road speeds and reducing vehicle operating costs.

These benefits will be particularly strong for journeys to and from the airport and the sea port. For example, during the AM peak in year 2036, travel time savings will average 15 minutes on journeys between the St Peters Interchange and Terminals 2/3 and 9 minutes to the sea port.

The Port Botany Rail Duplication will increase the number of train paths available on the freight network which can support increased mode share for freight accessing the sea port. In other words, a significant amount of freight can be diverted from road to rail.

In addition to the quantified efficiency benefits (i.e. travel time, vehicle operating cost savings, environmental and accident savings) of Sydney Gateway, the broader community also derives a number of other benefits:

- **Amenity benefits** – the proposed infrastructure has the ability to reduce the number of containers transported by road and change the route used.
- **Reliability benefits** – The Sydney Gateway road project will improve reliability to Sydney Airport. Both private and heavy vehicles can place much higher levels of reliance on motorways that provide a ‘door-to-door’ link to the airport.
- **Public transport benefits** – change in public transport demand shows that the benefits to the public transport network will be limited to marginal travel time savings for the bus services operating through Mascot.

A quantification of Wider Economic Impacts (WEIs) was undertaken to support the analysis but in line with NSW Treasury guidelines was not incorporated within the core evaluation.

The outcomes of the analysis

The Sydney Gateway Final Business Case presents an economic analysis of the road and rail projects separately.

The Final Business Case estimates that the Sydney Gateway road project delivers total direct benefits of $4.6 billion at a total lifecycle present value cost of $1.6 billion, resulting in a Net Present Value of $3 billion and a Benefit Cost Ratio of 2.8. Over 55 per cent of the benefits result from transport improvements can be attributable to travel time savings.

Wider economic benefits are considered as a sensitivity to the core transport analysis. The analysis indicates that if Wider Economic Benefits (WEBs) are incorporated into the analysis the road project has a Net Present Value of $4.2 billion and a Benefit Cost Ratio of 3.6, indicating that for every dollar invested in the Project, there will be a return of $3.60. Sensitivities were performed on the economic results to test their robustness.

The Final Business Case presents a Benefit Cost Ratio for the Port Botany Rail Duplication of 4.3 and a Net Present Value of $862 million. This analysis was undertaken as part of the ARTC Rail Duplication Business Case that was presented to the Australian Government in November 2018.

Table 1 below presents the summary results of the economic analysis. The analysis applied the present value of the P50[12] cost estimate and the measured economic benefits discounted at 7 per cent.

Economic results – including WEBs (P50) (Road infrastructure) – Sydney gateway road project	($m)
Capital costs	$1,608.7
Recurrent costs	$27.1
Total costs	$1,635.8
Reliability benefits	$530.5
Vehicle operating cost benefits	$1,355.1
Travel time savings	$2,589.7
Other benefits / cost impacts	$160.6
Total benefits (without WEBs)	$4,635.9
WEBs	$1,264.4
Total benefits (with WEBs)	$5,900.3
Project KPIs (without WEBs)	
Net Present Value	$3,000.2
Benefit Cost Ratio	2.8
Project KPIs (with WEBs)	
Net Present Value	$4,264.6
Benefit Cost Ratio	3.6

Source: Roads and Maritime Services (2018), Sydney Gateway Final Business Case

[12] Determined by probabilistic analysis, a P50 value provides a 50 per cent level of confidence that the estimated cost will not be exceeded at project completion.

Deliverability

Procurement

It is proposed that Transport for NSW will procure using a single contractor covering the **Motorway Package** (Stage 1) and **Terminals 2 & 3 Access Package** (Stage 2) for design and construct.

The **Port Botany Rail Duplication works** will be managed and procured by ARTC. ARTC has indicated to the Sydney Gateway team that a D&C Contract is the most suitable form of procurement for the planned rail duplication. The use of traditional procurement method reflects the expectation that, following appropriate development and planning of the works by ARTC, the risks to the rail project can be confidently priced by an experienced contractor.

Timeframe

Transport for NSW is targeting a project completion date of late 2023 to align with completion of Stage 3 of WestConnex. The target date will be a key focus for the Sydney Gateway team during the ongoing development of both the reference design and the delivery strategy.

It is proposed that a procurement process for the roads packages will commence in mid-2019 and be completed in mid-late 2020. Contract award for both packages will occur shortly after the Environmental Impact Statement (EIS) or Major Development Plan determination. Main construction works are planned to commence in 2021.

It is proposed that the rail duplication line will commence enabling works in early 2020 and be open for operations in early 2024.

Key risks and mitigation

The Business Case reflects a robust risk management process that has identified risks to Sydney Gateway and describes how these risks will be managed. Identified risks are considered tolerable and treatment strategies are in place. Future phases will involve ongoing management and treatment of key risks and opportunities, engagement with stakeholders, along with implementation of elements described within the Sydney Gateway Risk Management Plan. Key risks include:

- Site contamination and ground conditions including the former Tempe Tip
- Management of constraints, interfaces and interdependencies with key stakeholders including Sydney Airport, ARTC and adjacent parties
- Complexity of services/utility works
- Construction impacts including traffic disruption
- Design and delivery risk affecting cost and schedule.

The Infrastructure NSW view

The *State Infrastructure Strategy 2018-2038* considered Sydney Gateway and noted that it provides a unique opportunity to support productivity and economic benefits to the State. The Strategy recommended that Sydney Gateway is subject to scrutiny against other potential government investments, particularly in relation to its relative city-shaping benefits and that any decision to invest should be subject to a Business Case demonstrating a positive economic return.

The Final Business Case for the road component provides this analysis and demonstrates strategic merit, a well-defined project scope and a positive Benefit Cost Ratio (BCR) of 2.8 to 3.6, depending on the quantifiable benefits included. Under sensitivity testing, the analysis continued to return positive BCRs.

A number of recommendations were made by the Infrastructure NSW gateway review team, which the Sydney Gateway team are responding to. This includes:

- Assessment of the active transport and urban design outcomes early in the design refinement phase for incorporation into the planning approval process.
- Conducting an in-depth review of the delivery program and procurement strategy.
- Documenting, assessing and learning from relevant experiences from other major projects and implementing key governance and management capability to ensure the successful delivery of this project.
- Actively engaging with key stakeholders including Sydney Airport Corporation Limited and ARTC to help align all parties throughout the planning, risk management, design development, procurement, and delivery process.

Sydney Gateway has a long development history through WestConnex, and the core issues and opportunities are well understood. The preferred option is highly likely to deliver the significant service improvements and benefits described in the Final Business Case.

The reduction in congestion that building the project will have on the Mascot town centre, and South Sydney more broadly, present an opportunity for Transport for New South Wales to improve the on-road public transport and cycling networks, which will deliver greater connectivity for non-private vehicle users. During delivery of the project, Transport of NSW should consider impacts on local roads and the Mascot town centre and engage with the community to manage local road and urban amenity disruptions.