HOMEBUSH BAY BRIDGE
connecting communities

Fairmead Business Proprietary Ltd

HOMEBUSH BAY BRIDGE

Draft Environmental Assessment
for Public Exhibition
Volume I - Main report

February 2012

ARUP

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February 2012

Certification

Document title	Homebush Bay Bridge Environmental Assessment Draft for public exhibition	Arup job number 221379
Description	Environmental assessment prepared under Part 3A of the *NSW Environmental Planning and Assessment Act, 1979*	
DP&I application number	MP 10_0192	
Proponent	Fairmead Business Pty Ltd	
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Certification	I certify that I have prepared the contents of the environmental assessment in accordance with the Director General's Requirements dated 21 December 2010, and that to the best of my knowledge, the information contained in the environmental assessment is neither false nor misleading.	
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	Date: February 2012	

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Abbreviations

Abbreviation	Full name
AHD	Australian height datum - a common national plan of level approximately equivalent to the height above sea level
ANZECC	Australian and New Zealand Environment and Conservation Council
ARI	Average return interval - the average, or expected, value of the periods between exceedances of a given rainfall total accumulated over a given duration
AS	Australian standard
AtoN	Aids to navigation
dB	Decibel, a logarithmic unit of sound intensity
dB(A)	A-weighted sound pressure level in decibels. The weighting is based on the frequency response of the human ear and has been found to correlate well with human subjective reactions to various sounds.
DCP	Development control plan
DIPNR	NSW Department of Planning and Natural Resources (now DP&I)
DP&I	NSW Department of Planning and Infrastructure
EP&A Act	Environmental Planning and Assessment Act 1979
EPA	Environmental Protection Agency (part of OEH)
GPT	Gross pollutant trap
IPCC	Intergovernmental Panel on Climate Change
LAeq	Equivalent continuous level. When a noise varies over time, the Leq is the equivalent continuous sound that would contain the same sound energy as the time varying sound.
LGA	Local government area
MSL	Mean sea level. A measure of the average height of the ocean's surface (such as the halfway point between the mean high tide and the mean low tide); used as a standard in reckoning land elevation.
MHWS	Mean high water springs. It is the highest level to which spring tides reach on the average over a period of time. This level is generally close to being the "high water mark" where debris accumulates on the shore annually.
OEH	NSW Office of Environment and Heritage
PAC	Planning assessment commission
PVC-U	Polyvinyl chloride - un-plasticised
RCD	Residual current device
REP	Regional environmental plan
RL	Reduced level
RMS	NSW Roads and Maritime Services (former RTA)
RTA	Former NSW Roads and Traffic Authority (now RMS)
SLS	Service limit state
SOPA	Sydney Olympic Park Authority
STA	State Transit Authority

TMAP	Transport Management and Accessibility Plan
ULS	Ultimate level state
VPA	Voluntary planning agreement - an agreement entered into by a planning authority (such as the Department of Planning and Infrastructure) and a developer. Under the agreement a developer agrees to provide or fund public amenities and public services, affordable housing, transport or other infrastructure.

Executive Summary

What is proposed?

Fairmead Business Proprietary Ltd proposes to build the Homebush Bay Bridge, which would span Homebush Bay between Rhodes and Wentworth Point.

The bridge is proposed for pedestrians, cyclists, public buses, and emergency and maintenance vehicles. Private vehicles would not be allowed to use the bridge.

The bridge would connect the emerging communities of Rhodes and Wentworth Point. At a regional level, it would also improve the connection between Rhodes and Sydney Olympic Park (to the south of Wentworth Point).

At Rhodes, the bridge would connect to Gauthorpe Street. At Wentworth Point, the bridge would connect to Footbridge Boulevard.

The bridge would be 300 ms long, 11.4 ms wide and 9.2 ms high at its highest point. It would have two lanes (one lane each way) for vehicles and cyclists, and a footpath. The deck of the bridge would also have rest stops, lighting, drainage and other services.

From the water, the bridge would have a minimum vertical clearance of 5.7 ms, and there would be a horizontal clearance over the main navigable channel of 20 ms. This would allow watercraft to continue to use the bay.

Proposed bridge location and context

Why is it needed?

The need for a bridge connecting Rhodes and Wentworth Point is identified in a number of NSW Government documents, including the *Sharing Sydney Harbour Access Plan 2003*, *Homebush Bay West DCP 2004, State Environmental Planning Policy (Sydney Harbour Catchment) 2005, Sydney Olympic Park Authority Master Plan 2030 and the Rhodes West DCP 2011.*

These government documents recommend building the bridge to encourage more attractive options for walking, cycling and public transport.

What benefits are expected?

The Homebush Bay Bridge would substantially improve the quality of life of residents in Rhodes and Wentworth Point. In particular, it would:

- Provide a safe and direct link between Rhodes and Wentworth Point, thereby contributing to community cohesion. Currently, there is no direct link between the two communities.
- Provide access to train and cross regional bus services at Rhodes station for people living in Wentworth Point.
- Provide access to the Sydney–Parramatta ferry service at Sydney Olympic Park for people living in Rhodes.
- Encourage walking and cycling to work as a viable alternative to the motor vehicle.
- Introduce new active leisure opportunities, promote the sharing of facilities on either side of the bay, and add value to the communities of Rhodes and Wentworth Point.
- Improve access to retail and commercial opportunities at Rhodes shopping centre for residents of Wentworth Point.
- Improve access to open space at Sydney Olympic Park for residents of Rhodes.

How would the bridge be built?

The bridge would be constructed from two work sites, one each at Rhodes and Wentworth Point. Some work would also occur over the water from barges.

The bridge superstructure would be built from reinforced and prestressed concrete supported on piers and piled foundation.

The project – including building the bridge and remediating the work sites – would take about 24 months.

What about the potential impacts?

The Homebush Bay Bridge would result in some impacts in the short term. These would not be significant.

In the short term, construction of the bridge would:

- Cause noise and vibration issues for some residents.
- Increase local traffic due to the movement of construction vehicles to and from the work sites.
- Divert foreshore access in some areas.

Mitigation measures have been identified to manage construction impacts.

The proposed marine and land based construction activities have been designed to minimise disturbance of sediments. There would not be excavation of contaminated sediments or material nor generation of hazardous waste. A construction environmental management plan which includes a water quality monitoring and reporting program would be in place during construction to minimise the dispersal of sediments.

Once it is built, the bridge would not have significant adverse environmental, social or economic impacts, provided the mitigation measures identified in this report were implemented.

The bridge has been sensitively designed to fit with and contribute to the built forms, streetscapes and public domains of Rhodes and Wentworth Point and would not have an adverse visual impact.

How would the likely impacts be managed?

This environmental assessment proposes a number of measures to address the expected adverse impacts of the bridge. Wherever possible, expected impacts would be avoided or lessened through careful design, construction and operational practices. Where a potential impact cannot be avoided or lessened, further management measures are proposed to ensure that the impact is contained to an acceptable level.

How to comment on the proposal

The Director General of the NSW Department of Planning and Infrastructure (DP&I) is exhibiting this environmental assessment and supporting documentation for a minimum of 30 days and inviting public comment.

Advertisements are being placed in appropriate newspapers and relevant public authorities are being notified in writing. The environmental assessment is available for inspection during the exhibition period at the DP&I head office and local council offices as well as on the DP&I website (http://www.planning.nsw.gov.au/).

During the exhibition period, any person is able to make a written submission to the Director General regarding the project.

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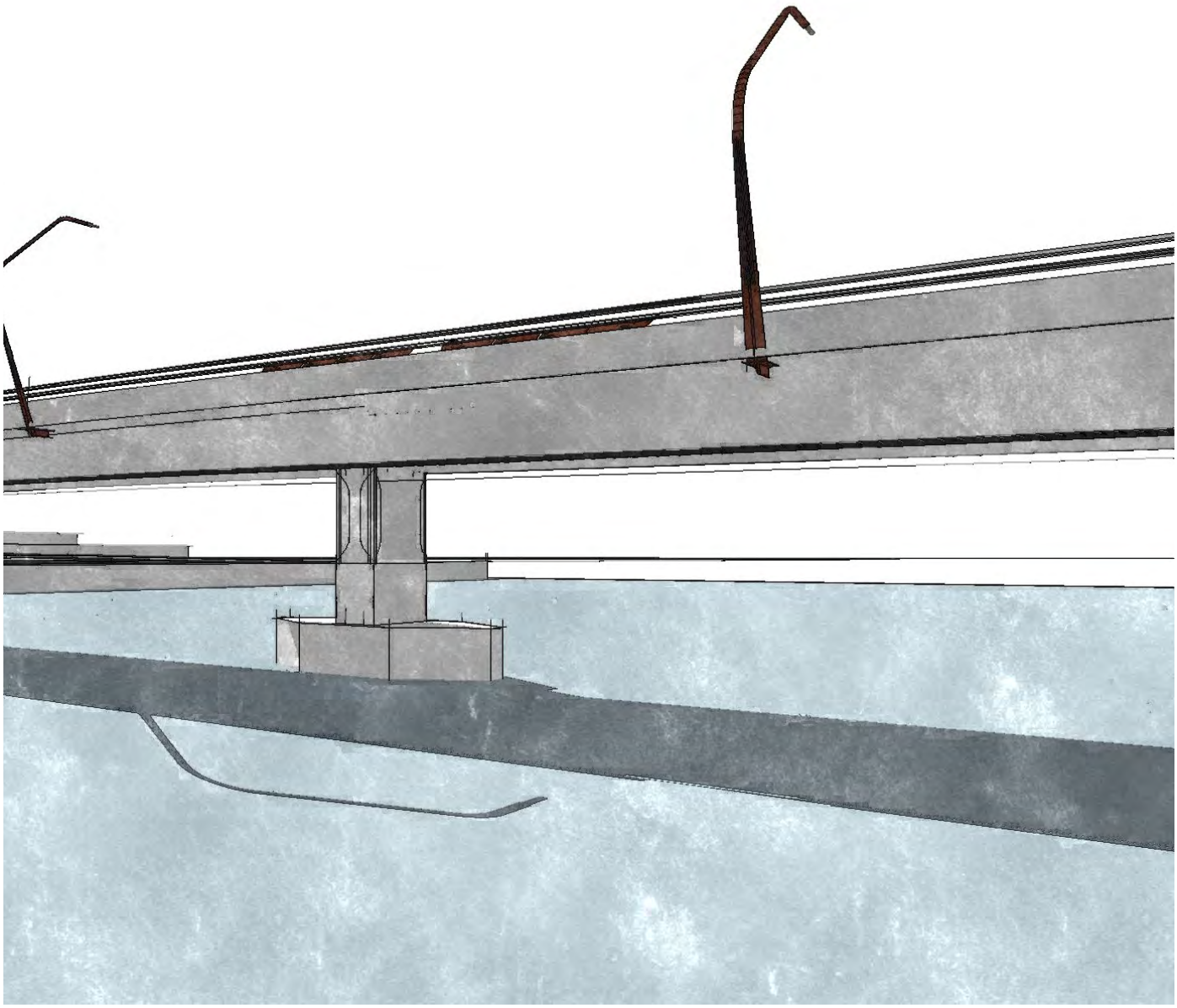

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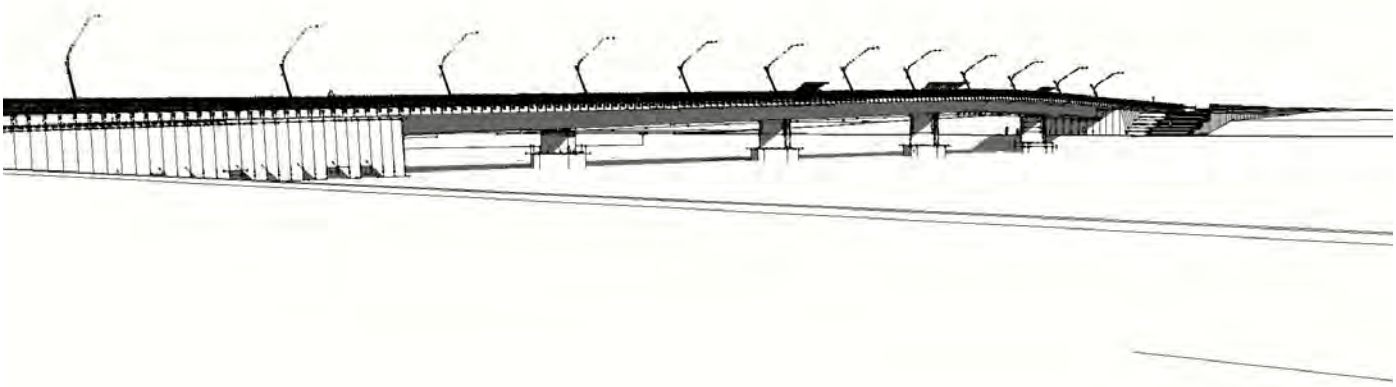
PART A

Introduction, context and alternatives



1 Introduction

This report is the environmental assessment for the proposed Homebush Bay Bridge prepared in accordance with Part 3A of the *Environmental Planning and Assessment Act 1979* (EP&A Act).

This Chapter provides background information on the proposed Homebush Bay Bridge, including information on the proponent, the proposal team, the site, and the planning approval process.

1.1 The proponent

Fairmead Business Proprietary Ltd (the proponent) proposes to build a bridge between Rhodes and Wentworth Point (formerly known as Homebush Bay West).

Fairmead Business Proprietary Ltd is a company formed by the following Wentworth Point landowners: Billbergia Group, Sekisui House Australia, City Freeholds and Homebush Bay Holdings.

Fairmead Business Proprietary Ltd proposes to fund the design, construction and maintenance of the bridge under a voluntary planning agreement (VPA) currently under discussion with the NSW Department of Planning and Infrastructure (DP&I) and Sydney Olympic Park Authority (SOPA). Once commissioned, ownership of the bridge would be transferred to SOPA.

1.2 Project team

An expert project team has been formed to deliver the environmental assessment of the Homebush Bay Bridge and includes:

ARUP	/ Project management / Engineering design / Statutory consultation / Traffic and access / Public domain / Navigation and safety / Climate change / Noise and Vibration / GHG
Scott Carver	/ Urban design rationale / Public domain / Visual impact / Overshadowing / Crime prevention through environmental design
Golder Associates	/ Contamination assessment and management plan
BIOSIS RESEARCH	/ Ecology
es EnvironmentalStrategies PROVIDING BENEFITS	/ Contamination audit statement and report
cpp CERMAK PETERKA PETERSEN	/ Wind
225 1785–2010 Rider Levett Bucknall	/ Cost estimates
KJA strategic communications & project management	/ Consultation and communication strategy

1.3 Project summary

The proposed bridge is called the Homebush Bay Bridge. It would carry public buses, emergency and maintenance vehicles, pedestrians, cyclists and public utility infrastructure. At a local level, the bridge would connect the two emerging communities of Rhodes Peninsula and Wentworth Point. At a regional level, the bridge would improve public transport connection between Rhodes and Sydney Olympic Park.

The ownership of the proposed bridge would be transferred to SOPA upon completion of the construction of the bridge.

1.4 The site

The site for the proposed bridge is located in Sydney's Homebush Bay, on the southern side of the Parramatta River between Rhodes and Wentworth Point. The location of the proposal is presented in Figure 1.1 while a site analysis of the bridge route and its surroundings is presented in Appendix C.

Figure 1.1 – Location map

1.4.1 Eastern approach – Rhodes

The eastern approach of the proposed bridge would be located on Lot 310 DP 1163025, Rhodes within City of Canada Bay local government area (LGA) and would connect to the intersection of Gauthorpe Street and Shoreline Drive. This is currently vacant land owned by Brookfield Multiplex.

The eastern approach to the bridge is shown in Figure 1.2.

It is understood that the land occupied on the eastern approach will be transferred to City of Canada Bay Council as dedicated land in the near future, and then leased by Council to SOPA for the purpose of the bridge.

Lot 310 DP 1163025 is within the area covered by *Rhodes West Development Control Plan 2011*. Once this area is fully developed, the eastern approach of the bridge will be bounded by:

- A multi-dwelling development to the north.
- City of Canada Bay community facilities to the south.
- Shoreline Drive to the east.
- Homebush Bay to the west.

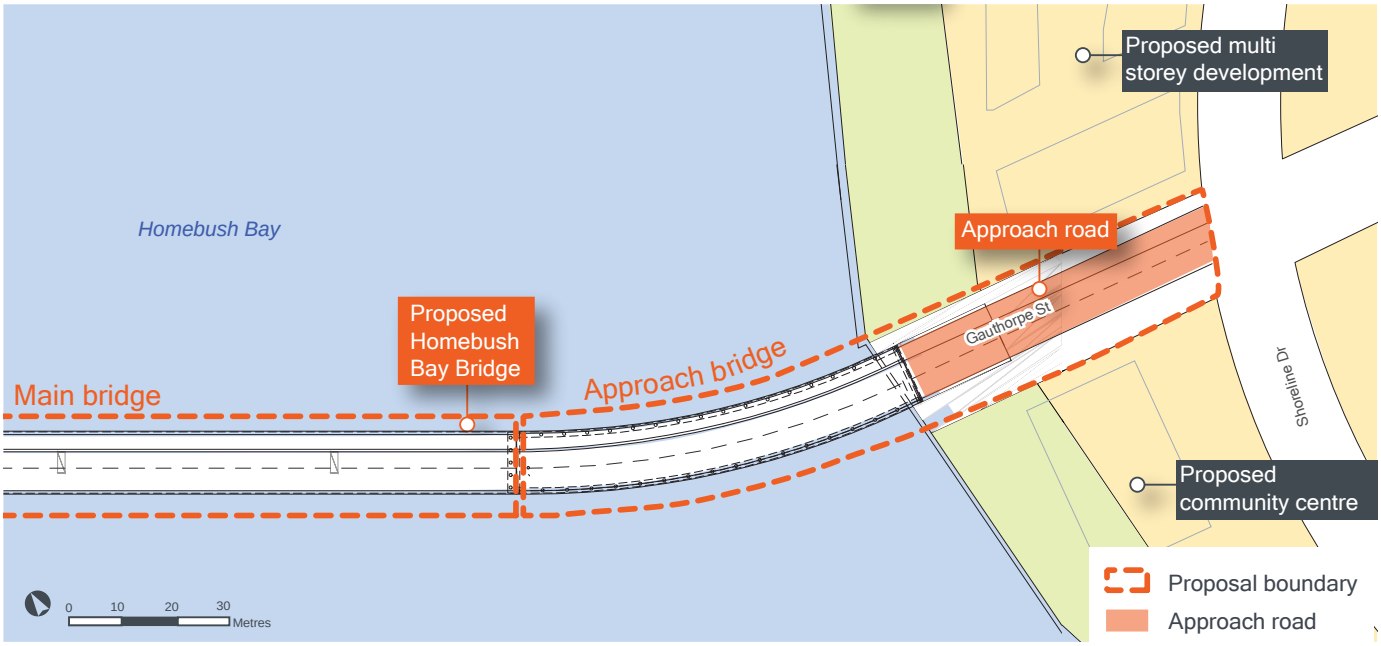


Figure 1.2 – Homebush Bay Bridge eastern approach

1.4.2 Homebush Bay

The bridge would be built over land known as harbour title CT V5018 F1; this land is below the mean high water mark and is owned by RMS. It is proposed that SOPA would lease from RMS the portions of land below the mean high water mark that would be occupied by the proposed bridge piers and piles.

Existing maritime uses within the proposed bridge crossing are limited due to

the shallowness of the navigational channel and restricted to passive boating (e.g. kayaking) and occasional traffic from maintenance boats. Proposed future recreational maritime uses on this section of the bay include a Rowing NSW 'sprint' rowing course that will run parallel to the Wentworth Point foreshore.

1.4.3 Western approach – Wentworth Point

The western approach of the proposed bridge would be at Lot 122 DP 1156412, Wentworth Point within Auburn LGA.

The approach road that connects to Hill Road is currently referred to as Footbridge Boulevard, and is part of the proposed master plan that governs Lot 122 DP 1156412 and is therefore outside this proposal.

Lot 112 DP 1156412 is owned by Billbergia (which is part of Fairmead Business Proprietary Ltd) and used for industrial purposes. The western approach road would be public by right of way of easement while part of the foreshore open space surrounding the road approach would be land dedicated to Auburn Council in the near future. The western approach road would be leased to SOPA for the purpose of the bridge.

Development on Lot 112 DP 1156412 is governed by *Homebush Bay West Development Control Plan 2004.* Once this area is fully developed, the western approach of the proposed bridge will be bounded by:

- Public open space (park) to the north.
- A multi-dwelling development to the south.
- Homebush Bay and a foreshore street to the east
- Footbridge Boulevard to the west.

The western approach to the bridge is shown in Figure 1.3.

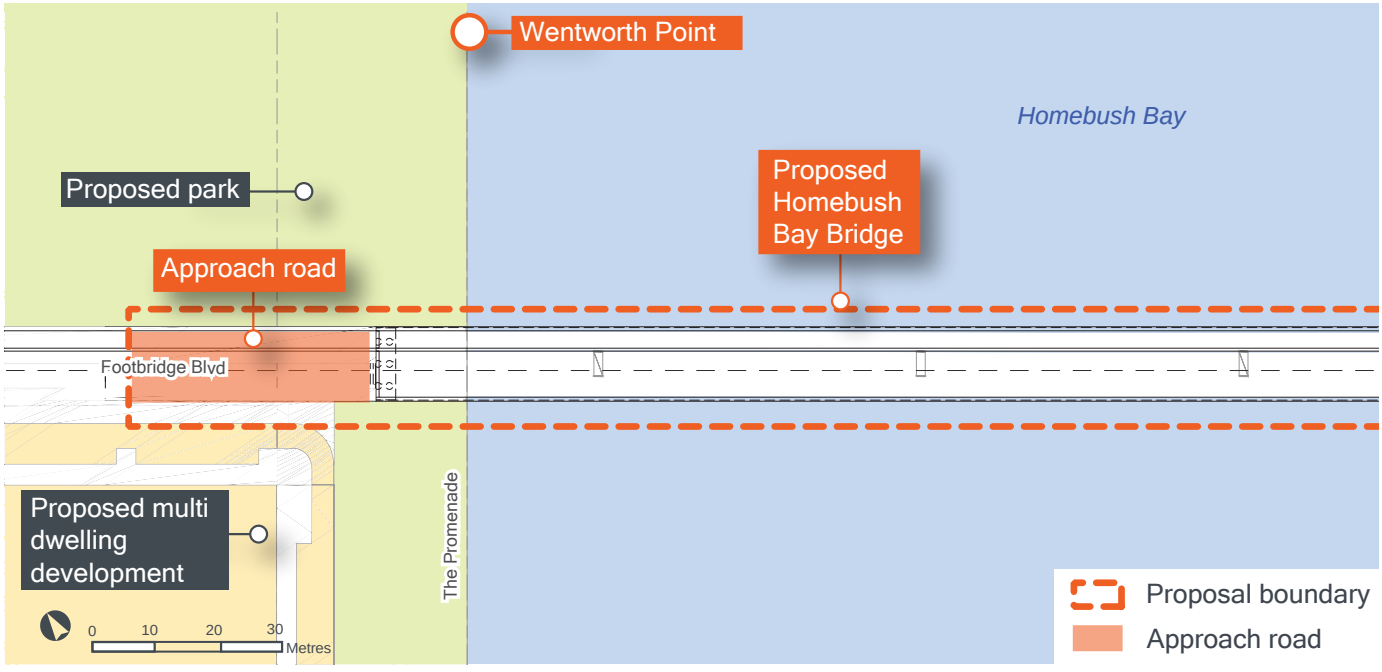


Figure 1.3 – Homebush Bay Bridge western approach

1.5 Planning approval process

1.5.1 New assessment system for State significant projects

On 16 June 2011, the NSW Government introduced a bill into Parliament to repeal Part 3A of the EP&A Act and replace it with an alternative system for assessing projects of genuine State significance. The bill, which has now been passed by Parliament, is known as the *Environmental Planning and Assessment Amendment (Part 3A Repeal) Bill 2011* and will reduce by about 50% the number of projects dealt with by the State; projects that do not qualify as 'State significant' will be assessed by the relevant local council.

On 13 May 2011, the Government announced several transitional arrangements for projects already in the Part 3A system pending its repeal. These included revoking the Part 3A status of a number of residential, commercial, retail and coastal projects. Under these arrangements:

- 63 projects will now either not be declared as major projects under Part 3A or will be immediately removed from the Part 3A system and generally handed back to local councils for assessment and determination by the relevant Joint Regional Planning Panel.
- 102 other residential, retail, commercial and coastal projects which have substantially progressed within the existing assessment process will continue under Part 3A pending its legislative repeal.
- All applications for other project types (such as mining, chemical and manufacturing, agricultural, tourist and significant infrastructure proposals) which are already in the Part 3A system will continue to be assessed and determined under Part 3A pending its legislative repeal.
- For significant private projects remaining in the system, the Minister for Planning and Infrastructure will delegate his determination role to the independent Planning Assessment Commission, while smaller less complex applications will be determined by senior officers of the Department of Planning and Infrastructure.

This proposal will continue to be assessed and determined under Part 3A of EP&A Act. This environmental assessment has been prepared in accordance with the process and requirements of Part 3A of the EP&A Act. The steps involved in the assessment process are described below.

1.5.2 Steps in the Part 3A assessment process

The Homebush Bay Bridge proposal was declared to be a project under Part 3A of the EP&A Act by the Minister for Planning and Infrastructure on 26 October 2010. The Ministerial declaration is presented in Appendix A.

Following the Ministerial declaration, the Director General of the DP&I issued the Director General's requirements for the environmental assessment on 21 December 2010. These requirements were prepared following consultation with relevant government agencies and are presented in Appendix B.

The environmental assessment was prepared in accordance with the Director General's requirements and has been submitted to the Director General of the DP&I in accordance with section 75H of the EP&A Act. The Director General

has concluded that the environmental assessment adequately addresses the requirements.

The environmental assessment will be on public exhibition for a period of not less than 30 days. During this period, any person (including a government authority or agency) may make written submissions to the Director General.

Following the exhibition period, the Director General will provide copies of public submissions, or a summary of public submissions received through the exhibition period, to the proponent. The proponent will be required to prepare a response to the issues raised in submissions and may amend the project and statement of commitments to minimise impacts on the environment.

The Director General will then provide an environmental assessment report to the Minister for the purposes of the Minister's consideration of the project application.

At any stage, the Minister for Planning and Infrastructure may request the Planning Assessment Commission to review, advise or determine the project.

The Minister for Planning and Infrastructure may approve or disapprove the carrying out of the project. If approval is granted, then the Minister will determine the conditions that apply to the carrying out of the project. In making this determination, the Minister will consider the matters set out in section 75J(2) of the EP&A Act, including the Director General's report and, if applicable, findings and recommendations from the Planning Assessment Commission.

The planning approval process for the proposed Homebush Bay Bridge is illustrated in Figure 1.4.

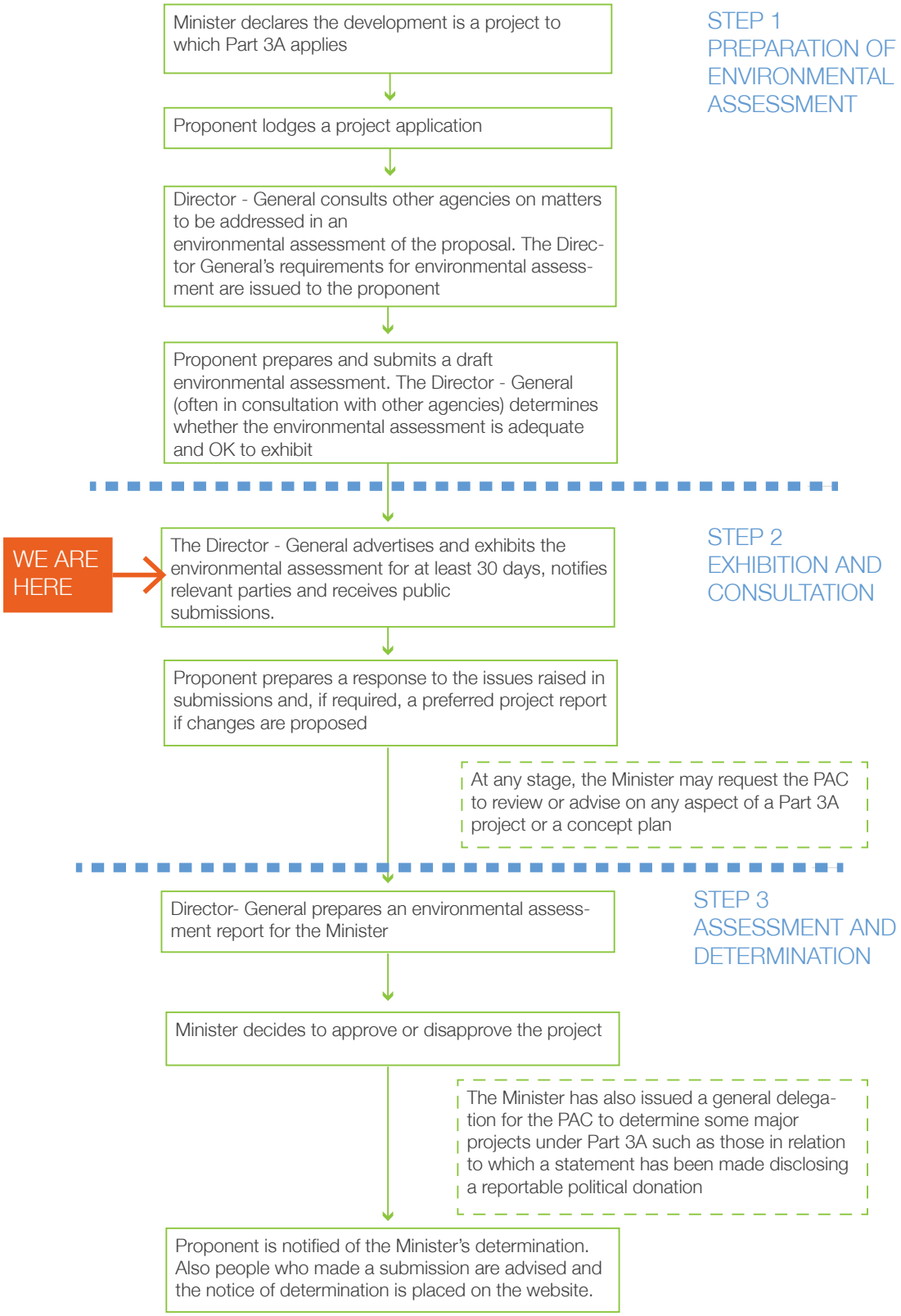


Figure 1.4 – Homebush Bay Bridge planning approval process (Source: DP&I 2011)

1.6 Structure of this environmental assessment

This environmental assessment describes the Homebush Bay Bridge proposal and provides an assessment of the key issues, as determined by the Director General of the DP&I. The environmental assessment has the following structure:

Volume I

Part A

- Introduction – provides a background to the proposal, its location and the planning approval process to follow.
- Strategic context – identifies the relationship of the proposal with broader strategic planning for the area and the need for the bridge.
- Alternatives – discusses the alternatives considered for the bridge route, the bridge structure and the configuration of the bridge lanes.

Part B

- Proposal description – describes the project objectives, bridge elements, engineering design parameters and proposed construction method.
- Proposal cost and funding – gives estimated costs for the construction and operational stages of the project and provides details on the proposal funding.
- Consultation – documents the existing and future statutory and non-statutory consultation for the proposal.

Part C

- Assessment of key issues – provides an assessment and analysis of key environmental issues and impacts.
- Consideration and management of other issues – provides an assessment and analysis of other environmental issues and impacts.
- Draft statement of commitments – describes measures to avoid, manage and mitigate major impacts identified by the environmental assessment.

Part D

- Justification and conclusion – justifies the project and summarises the environmental issues.

Volume II to Volume IV

- Appendices – provide supporting information to the environmental assessment report.

2 Strategic Context

This Chapter provides a strategic assessment of the proposal and its relationship to government policies and strategic planning documents. It identifies future known proposals for the development of Wentworth Point, Rhodes and the Sydney Olympic Park precinct and shows how the proposed bridge fits in the context of these future developments.

2.1 Director General's requirements

In relation to the strategic context, the Director General's requirements stipulate that this environmental assessment must provide a strategic assessment of the project, including a justification of the need, scale, scope and location of the project in the context of the strategic direction of the locality and region with consideration of any statutory and non-statutory requirements, including:

- *NSW 2021* (NSW Government 2011).
- *Metropolitan Plan for Sydney 2036* (NSW DP&I 2010).
- *West Central Subregion – Draft Subregional Strategy* (Department of Planning 2007).
- *Inner West Subregion – Draft Subregional Strategy* (Department of Planning 2008).
- *Integrating Land Use and Transport – A Planning Policy Package* (DUAP 2001).
- *Metropolitan Transport Plan – Connecting the City of Cities* (NSW Government 2010).
- *Action for Bikes – BikePlan 2010* (NSW RTA).
- *Planning Guidelines for Walking and Cycling* (DIPNR 2004).
- *Service Planning Guidelines, Sydney Metropolitan Regions* (Ministry of Transport 2006).
- *Sydney Olympic Park Master Plan 2030* (SOPA 2010).
- *Sydney Olympic Park – Parklands Plan of Management* (SOPA 2010).
- *Sydney Regional Environmental Plan No 24 – Homebush Bay Area* (DUAP 1992).
- *Sydney Regional Environmental Plan* (Sydney Harbour Catchment) (DIPNR 2005).

Other strategic documents relevant to the proposed Homebush Bay Bridge – which are not specifically noted in the Director General's requirements – are:

- *Sharing Sydney Harbour Access Plan* (DIPNR 2003).
- *Draft NSW Walking Strategy* (Premier's Council for Active Living 2011).
- *Rhodes West Development Control Plan* (City of Canada Bay 2011).
- *Homebush Bay West Development Control Plan* (Auburn City Council 2004).

The Director General's requirements also stipulate that the environmental assessment must:

- Identify how the project fits within these strategic outcomes.
- Identify how the project fits in the context of separate future proposals for the development of Wentworth Point, Rhodes and the Sydney Olympic Park Precinct.

The ways in which the proposed bridge aligns with the abovementioned documents are outlined below.

2.2 NSW 2021

2.2.1 Description

NSW 2021: A Plan to Make NSW Number One (NSW Government, 2011) presents the NSW Government's strategy to move the State forward over the next ten years and is based on five principal strategies with underlying goals. The five strategies are to:

- Rebuild the economy: restore economic growth and establish NSW as the 'first place in Australia to do business'.
- Return quality services: provide the best transport, health, education, policing, justice and family services, with a focus on the customer.
- Renovate infrastructure: build the infrastructure that makes a difference to both our economy and people's lives.
- Strengthen our local environment and communities: improve people's lives by protecting natural environments and building a strong sense of community.
- Restore accountability to Government: talk honestly with the community, return planning powers to the community and give people a say on decisions that affect them.

There are a number of goals specifically aimed at access and transport aspects of the State's development. Common aims and themes across these goals are the efficiency and effectiveness of public transport, and for active transport systems including to increase utilisation, customer experience, integration across modes and desired origin/destination points, frequency and reliability of services. Overall these all combine as a general intent to raise the attractiveness, and so use, of the public transport system.

Goal 8 of the Plan explains that increasing patronage on public transport would result in reduced traffic congestion, improved travel times and significant environmental benefits and that in order to increase patronage, public transport needs to be an attractive, convenient and efficient choice for commuters. To achieve this, the frequency and reliability of public transport services would be increased along with improved integration between transportation services.

NSW 2021: A Plan to Make NSW Number One updates the *NSW State Plan 2010.*

Relevant to the proposed Homebush Bay Bridge are the following targets and actions;

- Increase the share of commuter trips made by public transport
  - To and from Sydney CBD during peak hours to 80% by 2016
  - To and from Parramatta CBD during peak hours to 50% by 2016
  - To and from Newcastle CBD during peak hours to 20% by 2016
  - To and from Wollongong CBD during peak hours to 15% by 2016
  - To and from Liverpool CBD during peak hours to 20% by 2016
  - To and from Penrith CBD during peak hours to 25% by 2016
- Increase the proportion of total journeys to work by public transport in the Sydney Metropolitan Region to 28% by 2016
- Increase walking and cycling
  - More than double the mode share of bicycle trips made in the Greater Sydney region, at a local and district level, by 2016.
  - Increase the mode share of walking trips made in the Greater Sydney region, at a local and district level, to 25% by 2016.
  - Increase the percentage of the population living within 30 minutes by public transport of a city or major centre in metropolitan Sydney

These mode share targets remain the same as the *NSW State Plan 2010* 'Better transport and liveable cities.'

2.2.2 How the proposal aligns with NSW 2021 and the State Plan

The proposal would support the strategies and goals of *NSW 2021* by facilitating the potential expansion of the public bus network in an area of future population growth.

The underlying purpose and objectives of the proposal align well with the priorities in *NSW 2021*. In particular, the bridge would support increased opportunities to undertake journeys by more sustainable forms of transport.

2.3 Metropolitan Plan for Sydney 2036

2.3.1 Description

In December 2010, the NSW Government released the *Metropolitan Plan for Sydney 2036*. (This document supersedes the former *Metropolitan Strategy for Sydney to 2031*, prepared in 2005.)

The Metropolitan Plan is an integrated long-term plan that aims to sustainably manage Sydney's growth and strengthen its economic development to 2036 and beyond while enhancing its unique way of life, heritage and environment. It is founded on the following policy settings:

- Establish no new greenfield fronts to Sydney's existing urban footprint.
- Increase the proportion of homes within 30 minutes by public transport of employment in a major centre, ensuring more jobs are located closer to home.
- Build at least 70% of new homes in the existing urban area.
- Enable residential and employment growth in areas where there is available or

planned public transport capacity.

- Build at least 80% of all new homes within the walking catchments of existing and planned centres of all sizes with good public transport.
- Locate 50% of planned employment capacity in Western Sydney.
- Plan land use, service provision and infrastructure capacity for 770,000 additional homes by 2036 and 760,000 more jobs by 2036.

The *Metropolitan Transport Plan: Connecting the City of Cities* has been consolidated into the *Metropolitan Plan for Sydney 2036.*

2.3.2 How the proposal aligns with the Metropolitan Plan

The Metropolitan Plan identifies Sydney Olympic Park and Rhodes as two precincts forming a specialised centre due to their geographical proximity and potentially complementary role. (A 'specialised centre' is described as "areas containing major airports, ports, hospitals, universities, research and business activities. These perform a vital economic and employment role which generate metropolitan wide benefits").

Over time, both Sydney Olympic Park and Rhodes have the potential to take on the role of more traditional major centres with a mixture of housing, retail, office-based employment and services complemented by good public transport and access to open space and recreational facilities.

The Plan forecasts full-time equivalent employment growth of 4,000 in Rhodes and 19,000 in Sydney Olympic Park between 2006–36.

It also highlights the importance of integrating transport and land use planning to overcome Sydney's challenges of managing congestion and reducing energy related greenhouse gas emissions. In addition, the Plan updates the dwelling and employment targets for Sydney's subregions, as shown in Table 2.1.

Table 2.1 – Dwelling and employment targets. (Source: DP&I 2010)

Subregion	Net additional dwelling target 2036	Net additional employment target 2036
Inner West	+ 35,000	+ 25,000
West Central	+ 96,000	+ 98,000

The proposal would align well with the Metropolitan Plan and would:

- Provide an additional connection between the specialised centres of Sydney Olympic Park and Rhodes, and an alternative link between Rhodes railway station, Sydney Olympic Park railway station and wharf.
- Help to achieve a more connected and increasingly networked city structure and integrate the proposed land uses in Rhodes, Wentworth Point and Sydney Olympic Park with transport alternatives to private motor vehicles.

2.4 West Central and Inner West subregions – draft subregional strategies

2.4.1 Description

The West Central and Inner West subregional strategies translate long-term planning directions from the *Sydney Metropolitan Strategy* to the Ashfield, Canada Bay, Burwood, Leichhardt, Strathfield, Parramatta, Bankstown, Auburn, Fairfield and Holroyd LGAs (DP&I 2007, 2008).

The Olympic Park – Rhodes area is identified as an emerging area in the Sydney Region. The Rhodes area provides a town centre function for the subregion's retail needs while the Olympic Park area provides a potential economic centre to link Macquarie Park towards Parramatta.

Together, the two areas form a 'specialised centre' that is nominated as a unique employment, education, sporting, cultural and residential centre that provides higher skilled jobs to Western Sydney.

In addition, the strategies identify the Olympic Park – Rhodes 'specialised centre' as 'two of the largest brownfield redevelopment sites in metropolitan Sydney.'

The key directions set by the two strategies are presented in Table 2.2.

Table 2.2 – Key directions of the West Central and Inner West draft subregional strategies. (Source: DP&I 2007,2008)

West Central	Inner West
Provide local employment opportunities	Support and differentiate the role of strategic centres
Realise potential for economic development along the M7 motorway	Protect employment lands and working Harbour
Allow for housing growth close to public transport corridors	Promote Parramatta Road as an enterprise corridor
Provide greater housing choice and affordability	Improve housing choice
Coordinate planning and governance of centres and improve connectivity between centres	Manage traffic growth and local travel demand
Improve recreational facilities and access to open space	Protect and promote recreational activity and environmental assets
Promote the subregion's unique cultural diversity	Celebrate cultural diversity

2.4.2 How the proposal aligns with the subregional strategies

The following sections of the draft subregional strategies are relevant to the Homebush Bay Bridge proposal.

Transport

This section identifies the need to provide more frequent and reliable bus links to local centres within the subregions and to larger centres of the Sydney CBD, Parramatta, and Olympic Park – Rhodes, to potentially manage traffic congestion

and travel demand.

Housing

Rhodes is identified as a large site that will accommodate a significant number of dwellings to meet subregional housing targets by 2031.

Environment, heritage and resources

The parklands of Sydney Olympic Park are identified as a large regional open space. Access to waterways and links between bushland, parks and centres is a key issue as Sydney Olympic Park is acknowledged as being on the edge of urban areas, dislocated by main roads and the Parramatta River.

The proposal aligns well with the draft subregional strategies for the Inner West and West Central subregions. In particular, it would:

- Respond to the changing land use in the two subregional areas.
- Improve a connection between local centres and to larger town centres.
- Improve access to the parklands of Sydney Olympic Park, which would increase the community value of these lands.

2.5 Sharing Sydney Harbour Access Plan

2.5.1 Description

The *Sharing Sydney Harbour Access Plan* aims to increase the accessibility of Sydney Harbour foreshore through walking tracks, on-road and off-road cycleways, public domain improvements, wharves, jetties and pontoons, and landings for small boats.

The Access Plan identifies a series of strategic projects that align with the following vision: “improve public access to, and enhance the recreational enjoyment of, Sydney Harbour and its tributaries for the people of Sydney and visitors to the city”.

The Access Plan identifies a series of actions to enhance connections and facilities to Sydney Harbour, and highlights improvements to access to Homebush Bay, as shown in Figure 2.1.

Figure 2.1 – Proposed access improvements around Homebush Bay (Source: DIPNR 2003. Modified)

2.5.2 How the proposal aligns with the Access Plan

The proposed Homebush Bay Bridge is included in the Access Plan, and therefore the proposal would be consistent with the Access Plan. The bridge would:

- Facilitate the Access Plan's vision of improving public access to, and enhancing the recreational enjoyment of, Sydney Harbour.
- Facilitate recreational activities at Sydney Olympic Park.
- Link the Rhodes and Wentworth Point urban waterfronts.
- Encourage walking and cycling in the Homebush Bay area.

2.6 Integrating Land Use and Transport – A Planning Policy Package

2.6.1 Description

Integrating Land Use and Transport emphasises the need for urban structures, building forms, land use location, development designs, subdivision and street layouts to achieve sustainable transport objectives. It introduces the following concepts to be considered when planning for transport choice:

- Convenience – the transport mode needs to be easy to find and use, and to transfer from one mode to another.
- Information – reliable information at accessible locations is essential to encourage use of various travel alternatives.
- Proximity – transport facilities and services, such as cycle paths and bus services, need to be in close, convenient and obvious locations to people's trip origins and destinations.
- Destination choice – the more destinations that can be linked on a public transport route, the more attractive it will be.
- Directness – routes should take the shortest and least deviating course, with priority to achieve fast travel times for walking, cycling and public transport (e.g. pedestrian links, dedicated bus lanes, and bikeways).
- Security – the environment for walking needs to be comfortable and safe from personal attack or conflicts with traffic (e.g. waiting areas sheltered from the elements, natural surveillance, good lighting, bike lanes on major roads).

2.6.2 How the proposal aligns with Integrating Land Use and Transport

The design of the proposed bridge considers the concepts highlighted throughout *Integrating Land Use and Transport*. In particular, the bridge would provide a direct, convenient route for buses, pedestrians and cyclists between Rhodes and Wentworth Point/Sydney Olympic Park.

2.7 Metropolitan Transport Plan - Connecting the City of Cities

The *Metropolitan Transport Plan* has been consolidated into the *Metropolitan Plan for Sydney 2036.*

2.8 NSW BikePlan

2.8.1 Description

The *NSW BikePlan* is a comprehensive plan to transform cycling and to encourage people to ride more often and more safely in NSW. It promotes riding a bike as a normal, enjoyable and affordable transport choice for everyday personal travel, especially for the 20-to-40-minute, five-to-10-km trips that make up so much city travel. The BikePlan encourages more cycling by:

- Creating connecting cycling networks.
- Making cycling safe for all.
- Planning cycling-friendly neighbourhoods.
- Growing employment in cycling.
- Getting organisations working together to support cycling.

The Plan identifies Sydney Olympic Park as one of Australia's best places for family cycling. A section of the Metro Sydney Bike Network, as outlined in the BikePlan, is shown in Figure 2.2.

Figure 2.2 – Metro Sydney Bike Network near Homebush Bay Bridge (Source: RMS & DECCW, 2010)

2.8.2 How the proposal aligns with the NSW BikePlan

The proposed Homebush Bay Bridge would:

- Provide local and regional cycling connections and integrate into existing and proposed bike routes identified in the NSW BikePlan.
- Provide access for pedestrians and cyclists, thereby promoting active transport modes and encouraging mode shifts from private vehicles to walking and cycling.

2.9 Planning Guidelines for Walking and Cycling

2.9.1 Description

The *Planning Guidelines for Walking and Cycling* were prepared to help land-use planners and related professionals consider walking and cycling in their work. The Guidelines state that improving practice in planning for walking and cycling will create more opportunities for people to live in places with easy walking and cycling access to urban services and public transport and will help reduce car use and create healthier neighbourhoods and cities.

The Guidelines stress that creating a walkable and cycleable neighbourhood is an important element in creating a sustainable neighbourhood, one that is equitable, liveable, cost-efficient, safe, healthy and environmentally sound. This is, increasingly, a central theme of contemporary neighbourhood-scale planning.

2.9.2 How the proposal aligns with Guidelines for Walking and Cycling

The proposed bridge aligns with the Guidelines as it would provide the residents of Rhodes, Wentworth Point and Sydney Olympic Park with a bridge accessible to public transport, pedestrians and cyclists and, therefore, would indirectly assist in the creation of healthier neighbourhoods.

2.10 Draft NSW Walking Strategy

2.10.1 Description

The *Draft NSW Walking Strategy*, which is guided by the Premiers Council for Active Living, is expected to be ready for release in 2011. (In the interim, a series of supporting documents have been developed to inform the Walking Strategy) The Strategy highlights the following key issues:

- There is an opportunity to shift a high number of short vehicular trips to walking trips by better planning and considering design of the built environment to encourage walking trips and integrate walking into everyday lifestyles.
- Nationally, the mode of travel for children in Australia travelling to school has significantly shifted from active (walking/cycling) to inactive (car) modes in the past 30 years.
- Pedestrians experience a poor quality walking environment (and low level of service) in Sydney.

2.10.2 How the proposal aligns with the NSW Walking Strategy

The proposed Homebush Bay Bridge aligns with the Walking Strategy as it would encourage walking:

- For recreation.
- As a mode for travel to work.
- For access to public transport (Rhodes railway station, Sydney Olympic Park railway station and ferry wharf).
- To access services, including the proposed maritime school at Wentworth Point, rowing facilities at Wentworth Point and retail services at Rhodes shopping centre.

2.11 Service Planning Guidelines

2.11.1 Description

The *Service Planning Guidelines* were developed to provide strategic guidance from government into the bus industry, and to ensure the bus industry responds more closely to metropolitan planning and environmental objectives for the Sydney metropolitan region.

2.11.2 How the proposal aligns with the Service Planning Guidelines

The Service Planning Guidelines provide guidance for the initial assessment of the potential bus service that would use the proposed Homebush Bay Bridge.

2.12 Sydney Regional Environmental Plan No 24 –Homebush Bay Area

2.12.1 Description

This Regional Environmental Plan (REP) (deemed State Environmental Planning Policy) applies to the Homebush Bay Area and the majority of the Wentworth Point land. It provides a planning framework to guide and coordinate the continued renewal of the Homebush Bay area, acknowledges the principles of ecologically sustainable development and identifies and protects environmental conservation areas, as well as heritage items, heritage conservation areas and potential archaeological sites.

2.12.2 How the proposal aligns with REP 24

The proposed bridge would be designed, constructed and operated taking into account the aims of this REP and the identified environmental conservation areas, heritage items, heritage conservation areas and potential archaeological sites.

2.13 Sydney Regional Environmental Plan (Sydney Harbour Catchment)

2.13.1 Description

This REP (deemed State Environmental Planning Policy) zones the waterways into nine different zones to suit the differing environmental characteristics and land uses of the harbour and its tributaries. The area traversed by the proposed bridge belongs to zone 'W5 Water Recreation'. The objectives of zone W5 are:

- To give preference to and increase public water-dependent development so that people can enjoy and freely access the waters of Sydney Harbour and its tributaries.
- To allow development only where it is demonstrated that the public use of waters in this zone is enhanced and will not be compromised now or in the future.
- To minimise the number, scale and extent of artificial structures consistent with their function.
- To allow commercial water-dependent development, but only where it is demonstrated that it meets a justified demand, provides benefits to the general and boating public and results in a visual outcome that harmonises with the planned character of the locality.
- To minimise congestion of and conflict between people using waters in this zone and the foreshore.
- To protect and preserve beach environments and ensure they are free from artificial structures.
- To ensure that the scale and size of development are appropriate to the locality, and protect and improve the natural assets and natural and cultural scenic quality of the surrounding area, particularly when viewed from waters in this zone or from areas of public access.

2.13.2 How the proposal aligns with the REP

The proposal is consistent with the objectives of zone W5 Water Recreation as it would maintain the public enjoyment and accessibility of the Bay, maintain existing recreational uses and allow for future recreational uses, and be built to a scale and size appropriate to the locality.

The REP states that the proposed Homebush Bay Bridge may be built in accordance with the provisions of the *Homebush Bay West Development Control Plan 2004*, but only with development consent. The proponent proposes to build the bridge in compliance with these requirements.

2.14 Homebush Bay West Development Control Plan

2.14.1 Description

The *Homebush Bay West Development Control Plan* (DCP) applies to Wentworth Point (formerly known as Homebush Bay West), in particular to the land bounded by Bennelong Road, Hill Road, Homebush Bay and Parramatta River as shown in Figure 2.3.

The DCP aims to guide integrated development of the peninsula within an urban framework that is well connected and accessible, provides for a range of land uses and building forms, is clearly laid out and robust enough to support future change.

One of the DCP objectives is to increase and enhance the opportunities for pedestrians and cyclists to access the precinct and to move safely and comfortably within the public domain. A supporting objective of the latter is to provide a pedestrian and cycle bridge between Wentworth Point and Rhodes Peninsula subject to determination in transport studies and appropriate funding arrangements.

Future known development proposals under land covered by the DCP are:

- *Wentworth Point Draft Master Plan 2030*.
- Wentworth Point Maritime Precinct development.
- *No. 1 Burroway Road Development Control Plan 2006*.

These three proposals are discussed in the following sections.

Figure 2.3 – Homebush Bay West DCP (boundaries) (Source: DIPNR 2004)

2.14.2 Wentworth Point Draft Master Plan 2030

The *Wentworth Point Draft Master Plan 2030* applies to SOPA's land at Lot 1 DP 859608 located at the northern end of Wentworth Point. Based on information provided by SOPA, the development includes:

- Overall gross floor area of 23,513 square ms.
- About 4,400 permanent residents (when the site is fully developed).
- Daily working population of about 70 people employed in the proposed retail and commercial areas.
- Multi-storey buildings with mixed retail and commercial uses at the lower levels and residential uses at the upper levels. Buildings would have a maximum floor space ratio of 2.2:1.
- A 10 m wide link through the site connecting the development to the ferry wharf terminal.
- Land dedicated to public streets.
- Foreshore land dedicated to public open space with some one-storey pavilions and temporary structures.
- Maintenance of the existing ferry wharf terminal and associated structures.

An artist's impression and illustrative plan of this development are presented in Figure 2.4 and Figure 2.5 respectively.

The proposed Homebush Bay Bridge aligns well with SOPA's Wentworth Point Draft Masterplan 2030 because it would provide future residents and workers of this development with an alternative access to Rhodes railway station and shopping centre.

Figure 2.4 – SOPA's Wentworth Point precinct artist's impression (Source: SOPA 2010)

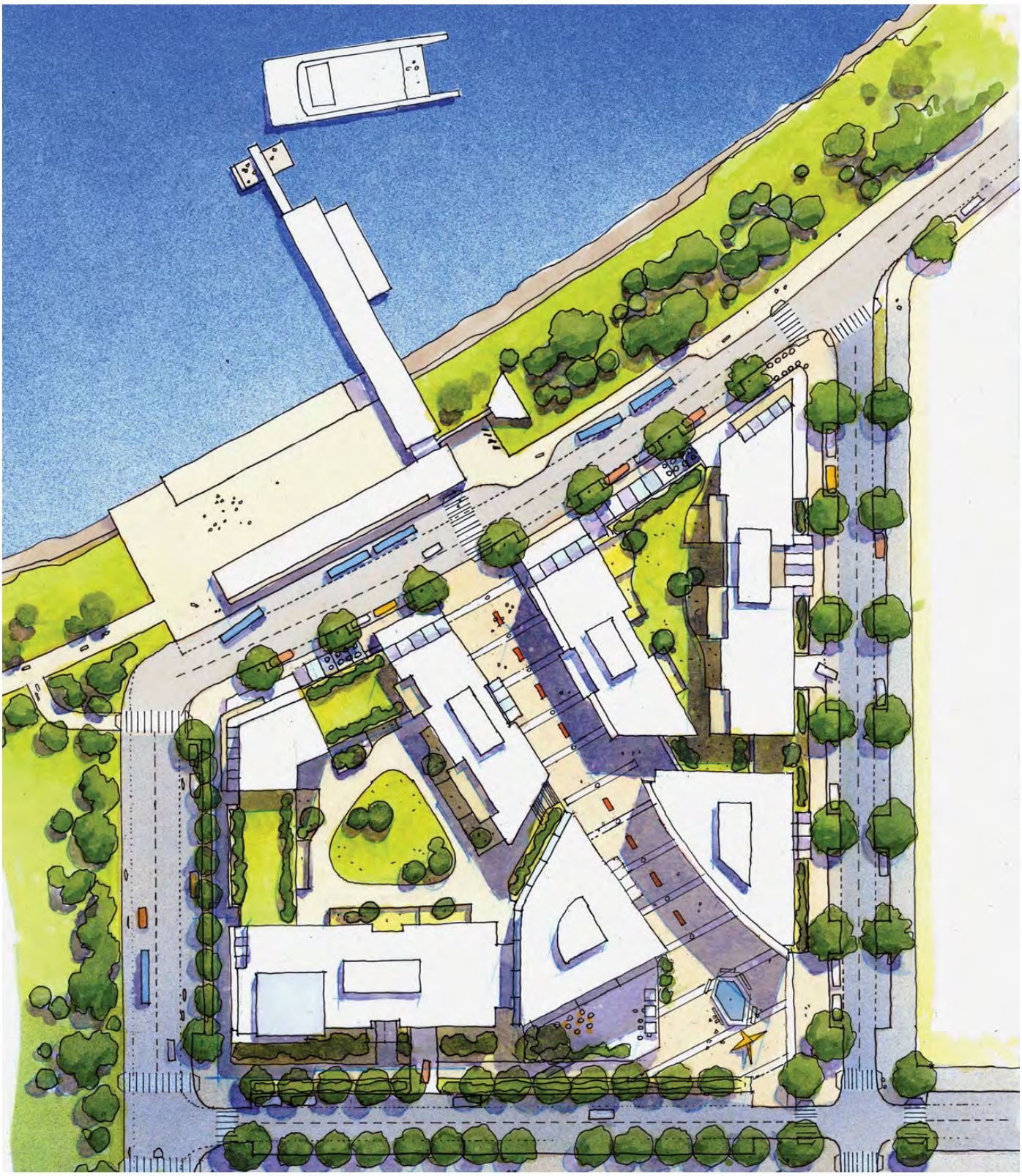


Figure 2.5 – SOPA's Wentworth Point precinct illustrative plan (Source: SOPA 2010)

2.14.3 Wentworth Point maritime precinct development

This development is being planned on two RMS (former NSW Maritime) sites at Wentworth Point:

- 3 Burroway Road (land known as Lot 2 DP 859608).
- 14A–D Hill Road (land known as Lot 3 DP 859608).

Based on information provided by RMS, these two sites would be used as a maritime precinct comprising:

- About 64,785 square ms of gross floor area comprising maritime related development (the proposal has no residential component).
- Open space (4.3 hectares) including Wentworth Point Park and a vegetated buffer zone along the majority of the foreshore.
- About 250 daily workers when fully operational.

The Burroway Road land would comprise:

- A 600-boat dry stack facility.
- A 60-boat wet berth facility.
- Marine industrial floor area (8,500 square ms).
- A three-lane public boat ramp and 75 car and trailer parking spaces.
- A community facility (2,100 square metes).
- A consolidated administration building (1,260 square ms), which may include boat brokerage, office space and a restaurant.
- External hardstand (19,800 square ms) associated with the dry stack facility and maritime industrial units.
- A boat paint and refit area (2,700 square ms).
- A multi-level car park.

The Hill Road land would comprise:

- Marine industrial floor area (30,545 square ms).
- An educational facility (1,020 square ms). This would have some relationship to the maritime industry. The anticipated number of students is unknown.

The preliminary concept plan for the site is presented in Figure 2.6.

The proposed bridge would align well with the Wentworth Point maritime precinct development as it would:

- Provide an alternative link for workers and visitors to access the precinct.
- Have the required horizontal and vertical clearance over the navigational channel for the circulation of the maritime traffic generated by the proposed maritime precinct.

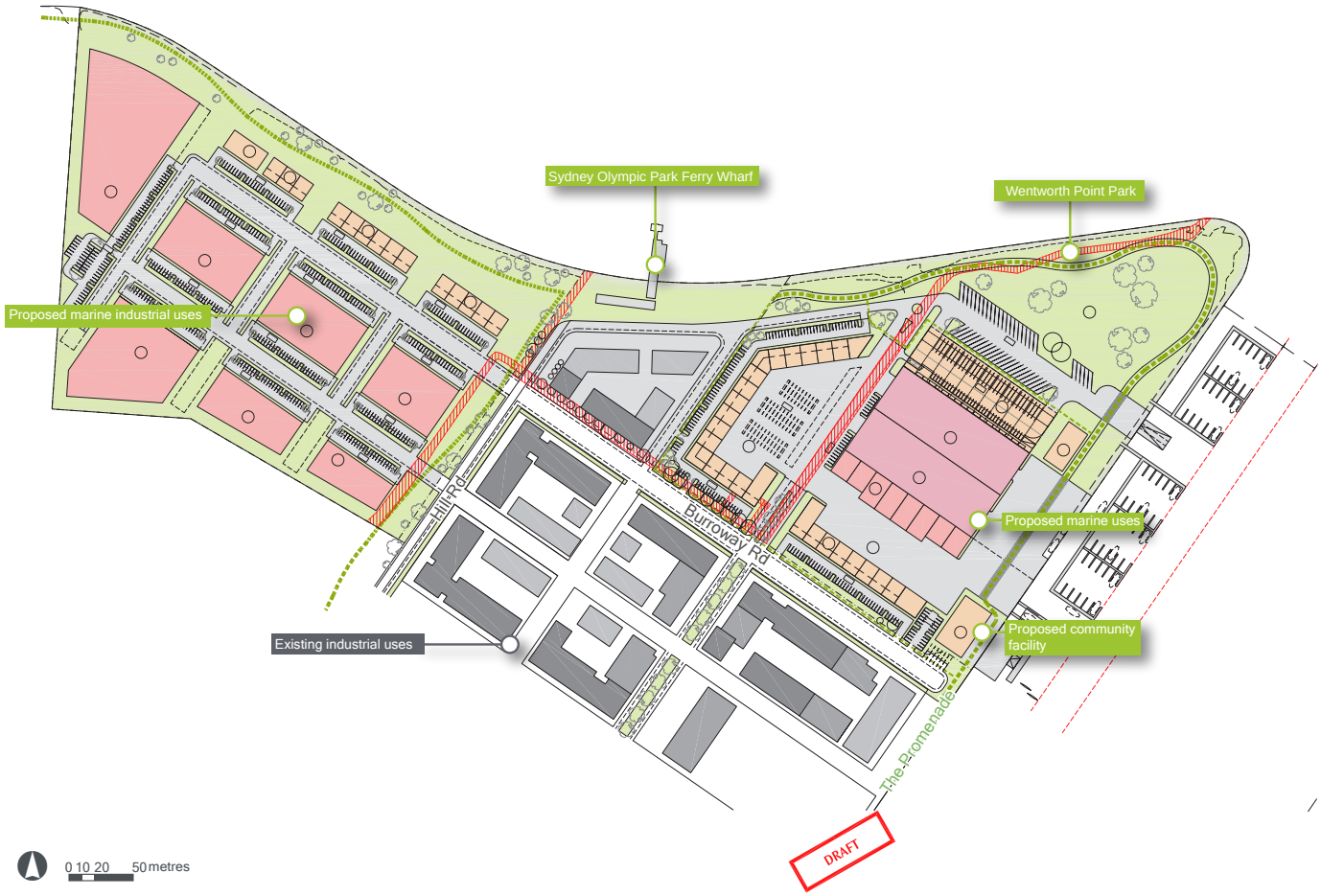


Figure 2.6 – Wentworth Point maritime precinct preliminary concept plan (Source: Noxon Giffen 2011)

2.14.4 No. 1 Burroway Road Development Control Plan 2006

This DCP outlines the master planning for the future development of the land known as Lot 10 DP 776611 located at 1 Burroway Road, Wentworth Point.

Development under this DCP comprises:

- A total gross floor area of 142,649 square ms, largely for residential uses with limited and commercial uses.
- Open space (a minimum of 10,973 square ms).

The indicative master plan for this development is presented in Figure 2.7.

2.14.5 How the proposal aligns with the DCP

The proposed Homebush Bay Bridge is identified in one of the supporting objectives of the DCP. It would fit well with the existing and future development of land covered under the DCP as it would increase and enhance the opportunities for pedestrians and cyclists to access the precinct and to move safely and comfortably within the public domain.

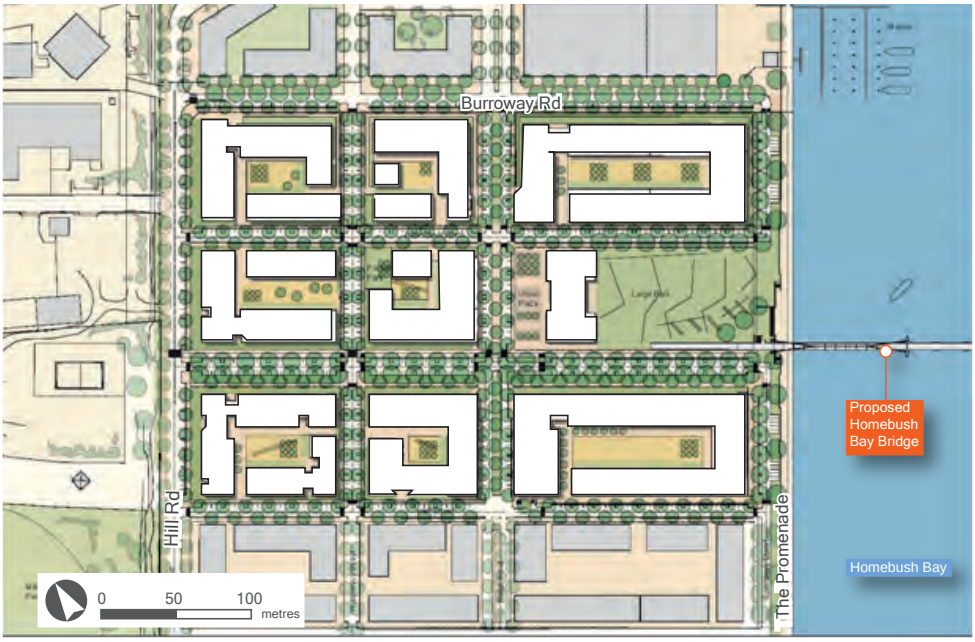


Figure 2.7 - No. 1 Burroway Road DCP Master Plan (Source: Scott Carver 2006)

2.15 Rhodes West Development Control Plan 2011

2.15.1 Description

The *Rhodes West Development Control Plan (DCP) 2011* precedes the former *Sydney Regional Environmental Plan 29: Rhodes Peninsula* (now repealed) and the *Renewing Rhodes Development Control Plan 2000* (now superseded). The DCP identifies the proposed Homebush Bay Bridge as a pedestrian and cycle link to the Gauthorpe Plaza, Gauthorpe Street and Walker Street. The DCP framework plan is presented in Figure 2.8.

Future known development proposals under the DCP comprise the remaining vacant land on Precinct B, which will be occupied by:

- A City of Canada Bay community facility that will function as the centre of community life on the Rhodes Peninsula, meeting a range of purposes and functions within walking distance. The community facility would be located on the southern side of the bridge approach road.
- Multi-dwelling development in Precinct B (lots 2A, 3A, 3B, 3C and 3D) of the plan. The developments include allocation of public open space for Foreshore Park South.

The building envelope plan for the remaining sites in Precinct B is presented in Figure 2.9.

2.15.2 How the proposal aligns with the DCP

The proposed bridge is identified in the DCP and would provide an alternative link for Rhodes residents to Sydney Olympic Park's parklands, railway station and ferry wharf. The proposed bridge landing at Rhodes would also complement the City of Canada Bay's proposed community facility at Gauthorpe Plaza and would provide a connection to the Rhodes Foreshore Reserve.

Figure 2.8 – Rhodes West DCP framework plan (Source: City of Canada Bay Council 2011. Modified)

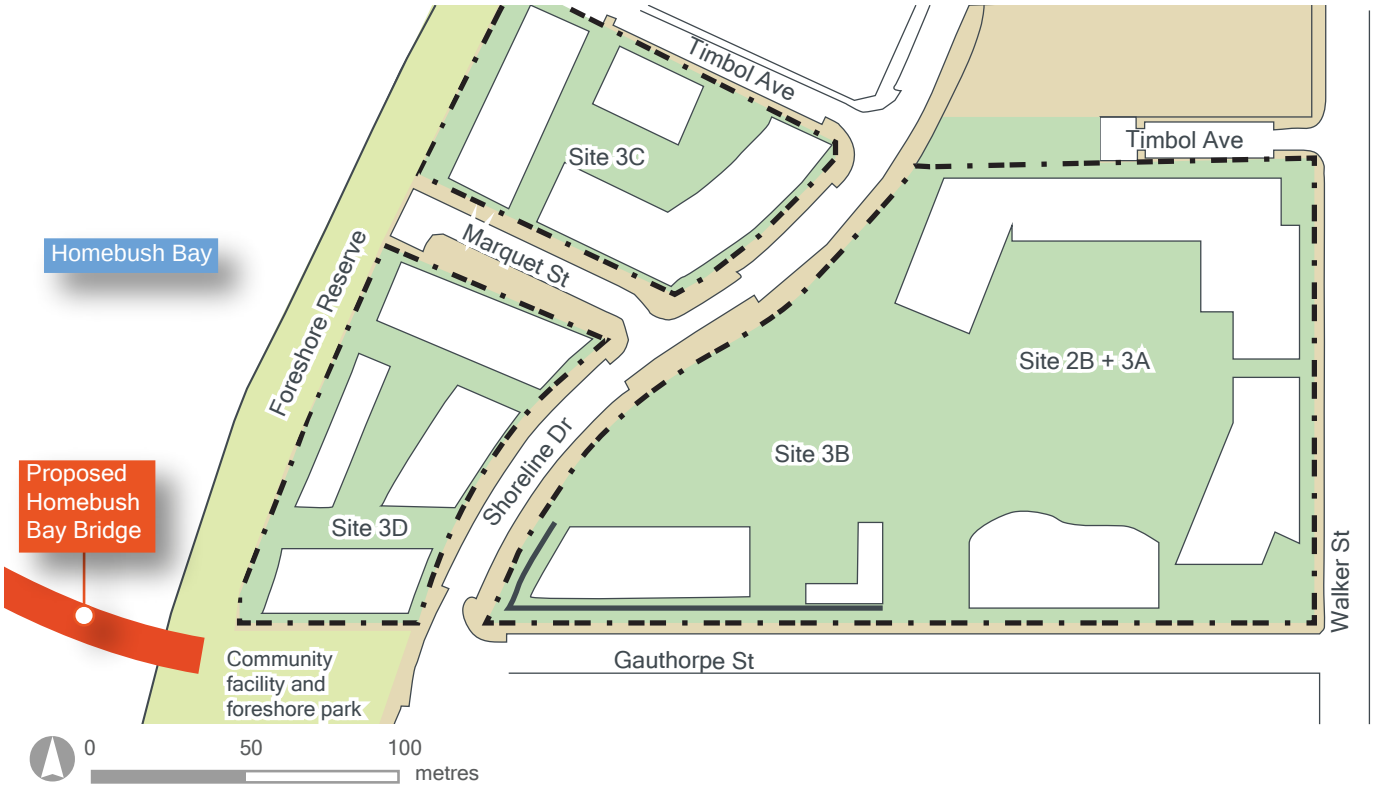


Figure 2.9 – Building envelope plan for the remaining sites in the Rhodes West DCP Precinct B (Source: City of Canada Bay Council 2010. Modified)

2.16 Sydney Olympic Park Master Plan 2030

2.16.1 Description

The *Sydney Olympic Park Master Plan 2030* is a long-term vision for the sustainable development of Sydney Olympic Park. The Master Plan organises future development in nine precincts:

- Central.
- Sports and education.
- Stadia.
- Sydney Showground.
- Parkview.
- Boundary Creek.
- Tennis.
- Southern sports.
- Haslams.

The location of these precincts is presented in Figure 2.10.

The precincts provide for an overall capacity of up to 1.45 million square ms of gross floor area, a projected daily population of 31,500 workers, 15,000 visitors, 14,000 residents and 5,000 students to ensure an active precinct 24 hours a day, seven days a week.

The Master Plan has a target of a journey-to-work non-car mode share split of 40% for the site and identifies the proposed Homebush Bay Bridge as a 'future metropolitan cycleway'. Under the Master Plan, the proposed bridge connects both cycleways and on-road cycle lanes in Olympic Park with the metropolitan cycleway in Rhodes.

2.16.2 How the proposal aligns with the Master Plan

Although the Master Plan directly governs the area outlined in Figure 2.1, it recognises that transport and access issues extend beyond the immediate Master Plan area. One of the key access and transport issues highlighted by the Master Plan is to "integrate transport service planning with adjacent suburbs, especially to reduce the reliance on private vehicle use for trips under five kms." The Master Plan identifies the link between Homebush Bay west and Rhodes as a key element in the transport network to meet transport and access targets, to enhance the communities and to support Sydney Olympic Park.

The proposed bridge aligns well with the Sydney Olympic Park Master Plan because it would:

- Provide Sydney Olympic Park visitors, students, workers and permanent residents with an alternative route and transport mode options to reach Rhodes railway station and shopping centre.
- Indirectly help to achieve the Master Plan's target of a journey-to-work non-car mode share split of 40% for the site.

2.17 Sydney Olympic Park Parklands Plan of Management 2010

2.17.1 Description

The main objective of this Plan of Management is to provide a statutory scheme of operations as the basis for managing the Sydney Olympic Park parklands. Under the Plan, the closest parkland to the bridge is the 25-hectare Woo-la-ra parkland, which contains a broad, grassed recreation area and provides views across the parklands, the town centre and Sydney metropolitan area, including the Sydney CBD. Woo-la-ra parklands hold a spiralling pedestrian/cycle path that extends to Hill Road car park. This path links with the Louise Sauvage Pathway, which extends from Haslams Creek Flats through Narawang Wetland, along the western boundary of Woo-la-ra, joining the River Walk at the Parramatta River.

2.17.2 How the proposal aligns with the Plan of Management

The proposed bridge aligns with the *Sydney Olympic Park Parklands Plan of Management* as it would enable Rhodes residents to have an additional pedestrian and cycle route to the existing pedestrian/cycle path network at Woo-la-ra.

Figure 2.10 – Sydney Olympic Park Master Plan 2030 precincts (Source: SOPA 2010)

2.18 Homebush Bay Bridge objectives

After considering the above government policy and planning documents, the following objectives were developed for the proposed bridge:

- Provide a safe and efficient link over Homebush Bay between the two emerging communities of Rhodes and Wentworth Point for pedestrians, cyclists, public transport (buses), maintenance and emergency vehicles whilst enabling continuing navigation of the bay.
- Encourage the use of transport options other than private motor vehicle in the Homebush Bay area.
- Deliver a bridge design that fits with and contributes to Rhodes and Wentworth Point's built forms, streetscapes and public domains; and to Homebush Bay's recreational maritime activities.
- Consider input from the community and key stakeholder representatives into the development and design of the bridge.
- Design, construct and operate the bridge in an environmentally sound and sustainable manner and in accordance with the project approval conditions, Australian Standards, relevant codes and guidelines, and good practice.

2.19 Conclusion

This assessment finds that the proposed Homebush Bay Bridge would align well with the objectives of all relevant planning and strategic documents noted in the Director General's requirements. In particular, the bridge would:

- Provide an additional connection between the specialised centres of Sydney Olympic Park and Rhodes, and an alternative link between Rhodes railway station, Sydney Olympic Park railway station and wharf.
- Encourage the use of public transport by improving access to Rhodes railway station, Sydney Olympic Park railway station and ferry wharf, and by providing a connection for Wentworth Point residents to the Burwood – Macquarie Park bus corridor.
- Improve public access to the parklands of Sydney Olympic Park, and provide a connection to Rhodes Foreshore Reserve.
- Improve public access to, and enhance the recreational enjoyment of, Sydney Harbour.
- Link the Rhodes and Wentworth Point urban waterfronts.
- Encourage walking and cycling in the Homebush Bay area, which would indirectly assist in the creation of healthier neighbourhoods.
- Provide Rhodes residents with an additional pedestrian and cycle route to the existing pedestrian/cycle path network at Woo-la-ra.
- Enhance the social and economic value of communities on both sides of the bridge by improving access to open space and public transport.
- Improve access to rowing facilities at Wentworth Point and retail services at Rhodes shopping centre.
- Have the required horizontal and vertical clearance over the navigational channel for the circulation of the maritime traffic generated by the proposed maritime precinct.

3 Alternatives considered

This Chapter provides an overview of the alternatives that were considered during the design process for the proposed bridge. It includes an overview of the potential bridge locations, structure types and lane configurations that were evaluated.

3.1 Bridge location options

3.1.1 Pedestrian/cycleway bridge route options

In 2003, Arup undertook a feasibility study for a pedestrian/cycleway bridge across Homebush Bay for Planning NSW (at the time, the bridge was not intended to carry buses).

In the study, Arup investigated four potential bridge locations. These were named option A, B, C1/C2 and D, as shown in Figure 3.1.

Figure 3.1 – Bridge location options (Source: Arup 2003)

3.1.2 Evaluation of route options

The bridge location options were evaluated on the basis of their ability to:

- Minimise the length of bridge.
- Integrate with nearby developments.
- Ecology/ environment.
- Relation to water based activation.
- Accessibility for pedestrians and cyclists.

The outcomes of the evaluation are summarised in Table 3.1.

Table 3.1 – Evaluation of bridge location options

Bridge location option	Characteristics
A	/ Approximate length between seawalls: 280 m. / Remote from pedestrian desire lines. / Does not connect into road network. / Does not provide good connection to Rhodes railway station. / Pedestrian/cyclist conflicts with proposed water related activities on shore at Homebush Bay West. / Landing at Rhodes is part of the area to be remediated first. / Limits use of bay for water craft.
B	/ Approximate length between seawalls: 240 m (shortest). / Remote from pedestrian desire lines. / Ecologically sensitive area where impacts should be minimised. / Piers in the bay may not be allowed. / Good links to shopping centre but not to Rhodes railway station.
C	/ Approximate length between seawalls: 280 m. / Connects to park and community facility in Rhodes. / Lands closer to centre of pedestrian concentration in Rhodes. / Lands in Homebush Bay West open space, enabling integration of ramp into parkland. / Good connection to Rhodes railway station. / Bridge enables management of water activities within the bay without restricting use of the proposed marina. / Consistent with Powells Creek landscape design framework.
D	/ Approximate length between seawalls: 480 m (longest). / Remote from Rhodes station.

Although the purpose of the proposed bridge was later changed – it is now intended to carry buses as well as pedestrians and cyclists – the alignment considerations were not significantly altered. This is because the main driver for the bridge location is accessibility for pedestrians and cyclists.

The addition of bus lanes to the original proposal would allow public buses across Homebush Bay and increase the accessibility and connectivity to:

- Rhodes Station and shopping centre for Wentworth Point precinct residents and Sydney Olympic Park residents.
- Sydney Olympic Park ferry wharf and parklands and the future Wentworth Point maritime precinct for Rhodes residents.

Option C was found to be the preferred location for the bridge when considering the various issues, constraints and benefits.

Within location C, two alignments were considered: C1 and C2.

- Alignment C1 is a straight bridge between seawalls connecting to the proposed foreshore reserves at Rhodes and Wentworth Point.
- Alignment C2 orients the bridge approaches on both sides of the bay aligning with the street grid, providing a clear line of sight between bridge approach and the bridge.

Alignment C2 has been adopted as the preferred alignment. A radial curve has been introduced at the Rhodes end of the bridge to provide a smooth transition suitable for buses.

The preferred landing point at Rhodes is near the end of Gauthorpe Street, where the City of Canada Bay Council proposes to locate a community facility and open space. Landing at this location would enable consolidation of facilities and, potentially, a small commercial facility near the landing. The open space would also provide a visual link to the proposed pedestrian/cyclist connection leading to Rhodes station. The proposed bridge would be aligned parallel to Gauthorpe Street to provide a visual connection.

The preferred landing point at Wentworth Point is on Lot 10 (owned by the proponent of the bridge), close to the centre of the future population. The proposed bridge would be aligned with Footbridge Boulevard, the main east–west street, and located immediately south of the designated park.

3.2 Bridge structure options

The proposed bridge comprises a main bridge and an approach bridge. Five options were considered for the structure of the main bridge. These are described in Table 3.2 and illustrated in the accompanying diagrams.

Only one option is proposed for the approach bridge. The proposed option is considered the most suitable form of construction for this part of the bridge, given its low elevation above sea level and the shallow water depth.

Table 3.2 – Bridge structure options

Bridge structure option	Characteristics
1 Precast super-T bridge (Figure 3.2)	Six spans of six 1800 mm deep precast super-T girders simply supported with an average span length of 40 m
2 Composite steel deck bridge (Figure 3.3)	Four spans of two 2400 mm deep steel girders continuous supporting a concrete slab with an average span length of 65 m
3 Conventional concrete box girder bridge (Figure 3.4)	Five spans of a single continuous box girder in post-tensioned concrete
4 Tapered soffit box girder bridge (Figure 3.5)	Five spans of a continuous twin-cell box girder with inclined webs in post-tensioned concrete
5 Tapered soffit box girder bridge with skylight (Figure 3.6)	Five spans of a continuous twin-cell box girder in post-tensioned concrete supporting a separate structure carrying the pedestrian path

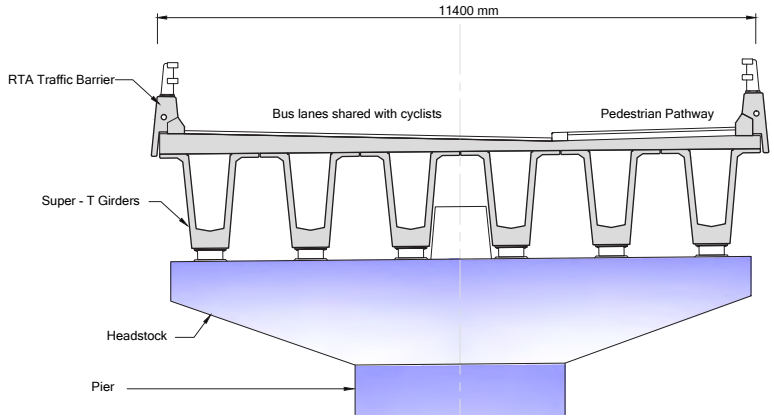


Figure 3.2 – Option 1: Precast super-T bridge

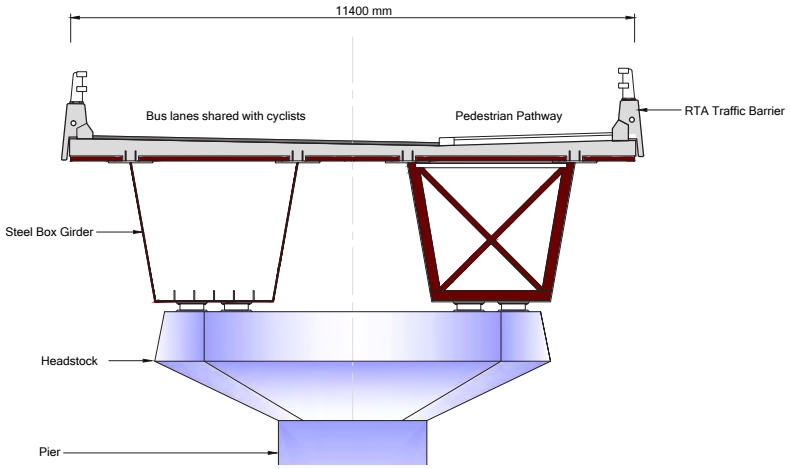


Figure 3.3 – Option 2: Composite steel deck bridge

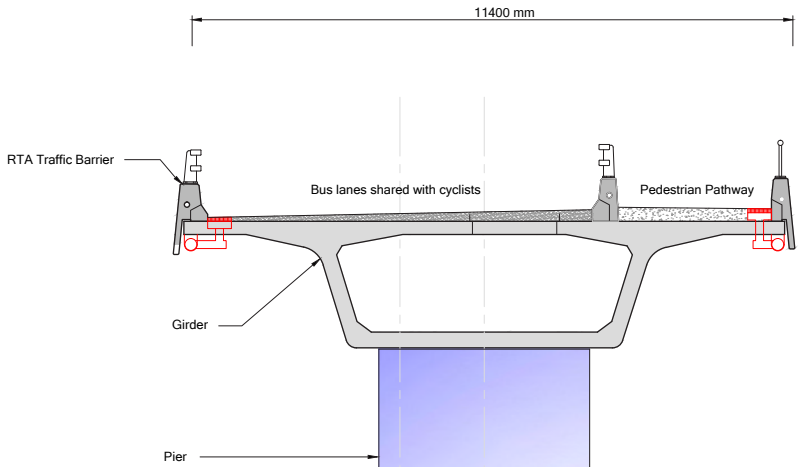


Figure 3.4 – Option 3: Conventional concrete box girder bridge

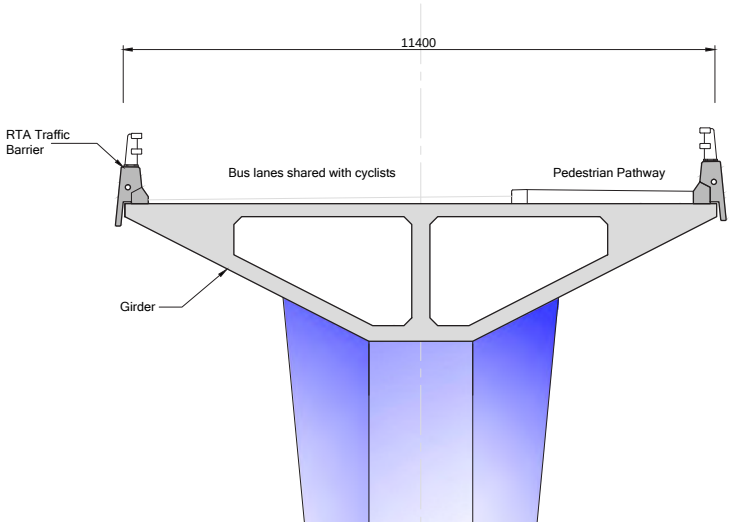


Figure 3.5 – Option 4: Tapered soffit box girder bridge (preferred option)

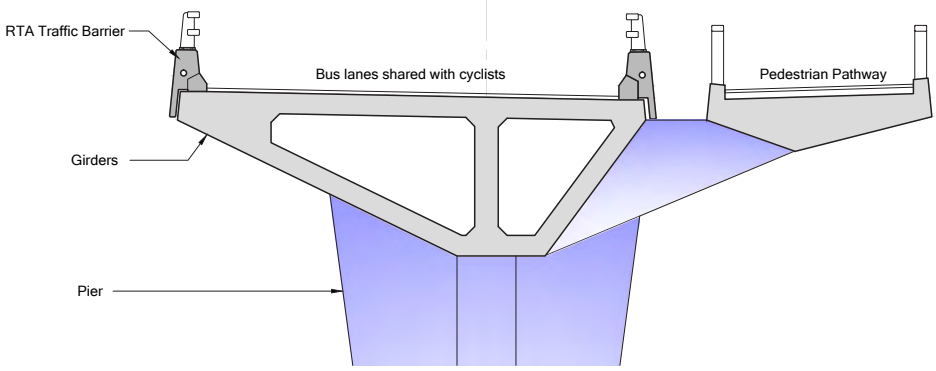


Figure 3.6 – Option 5: Tapered soffit box girder bridge with skylight

3.2.1 Process for evaluating bridge structures

The selection process to identify the preferred bridge structure considered the following criteria:

- Construction cost.
- Construction complexity.
- Maintenance cost.
- Architecture/aesthetics.

3.2.2 Evaluation of bridge structure options

The evaluation found that:

Option 1, the precast super-T bridge option, would have the least merit from an aesthetics point of view. Its cost is however identified as the cheapest of the five options.

Option 2, the composite steel deck bridge, would be reasonably costly to build. It would also have quite high maintenance costs, as expected for steel structures in aggressive environments.

Option 3, the conventional box girder bridge, is one of the more cost-effective options. It has a level of architectural merit but is not considered to be the best aesthetically.

Option 4, the tapered soffit box girder bridge, offers potentially high quality architectural and aesthetic outcomes with a cost premium associated with its cross-section and weight compared to the conventional box girder (option 3).

Option 5, the tapered soffit box girder bridge with skylight, would be the most costly and the most difficult and complex option to design and build.

It was concluded that Option 3 would be the best option for the main bridge. It would comprise a five-span, single-cell box girder continuous from the abutment on the Wentworth Point side (abutment A) to the fifth pier located in the bay (pier 5). Details on the preferred option are presented in Chapter 4.

3.2.3 Lane configuration options

A series of lane configuration options was considered through the development of the bridge design concept, responding to a wide range of technical, environmental, social, and aesthetic issues and objectives. The following configurations were considered:

- Single-lane bus lane, with passing bay. Within this option, three sub-options were evaluated:
  - Option 1a: Single-lane bus lane shared with pedestrians and bicycles
  - Option 1b: Single-lane bus lane plus separate pedestrian and bicycle lanes
  - Option 1c: Single-lane bus lane plus a shared pedestrian and bicycle lane.

- Two-way bus lane. Within this option, three sub-options were evaluated:
  - Option 2a: Two-way bus lane plus separate pedestrian and bicycle lanes
  - Option 2b: Two-way bus lane plus a shared pedestrian and bicycle lane
  - Option 2c: Two-way bus lane shared with bicycles, plus a separate pedestrian path.

These options are shown in Figure 3.7.

3.2.4 Valuation of lane configuration options

Key stakeholders and government authorities provided input into the development of the preferred lane configuration and design width for the bridge. Key considerations in this evaluation were:

- Relevant guidelines.
- Safety.
- Estimated capacity.
- Likely user groups.
- Bridge landing point context.
- Aesthetics.
- Costs across the whole lifecycle of the Homebush Bay Bridge.

Following an analysis of these considerations, it was determined that the preferred option would be a two-way bus lane shared with bicycles but with a separate pedestrian path. This would have the following benefits:

- It would allow for a two-way bus flow.
- It would allow flexibility for cyclists. Cyclists wanting to travel at speed could use the carriageway while cyclists with children could use the pedestrian path.
- It would give pedestrians a greater level of safety (as they would have a separate pedestrian path).
- It would provide a more desirable outcome for connections at each landing point.

A width of 11.4 m is required to accommodate the proposed bridge design and lane configuration.

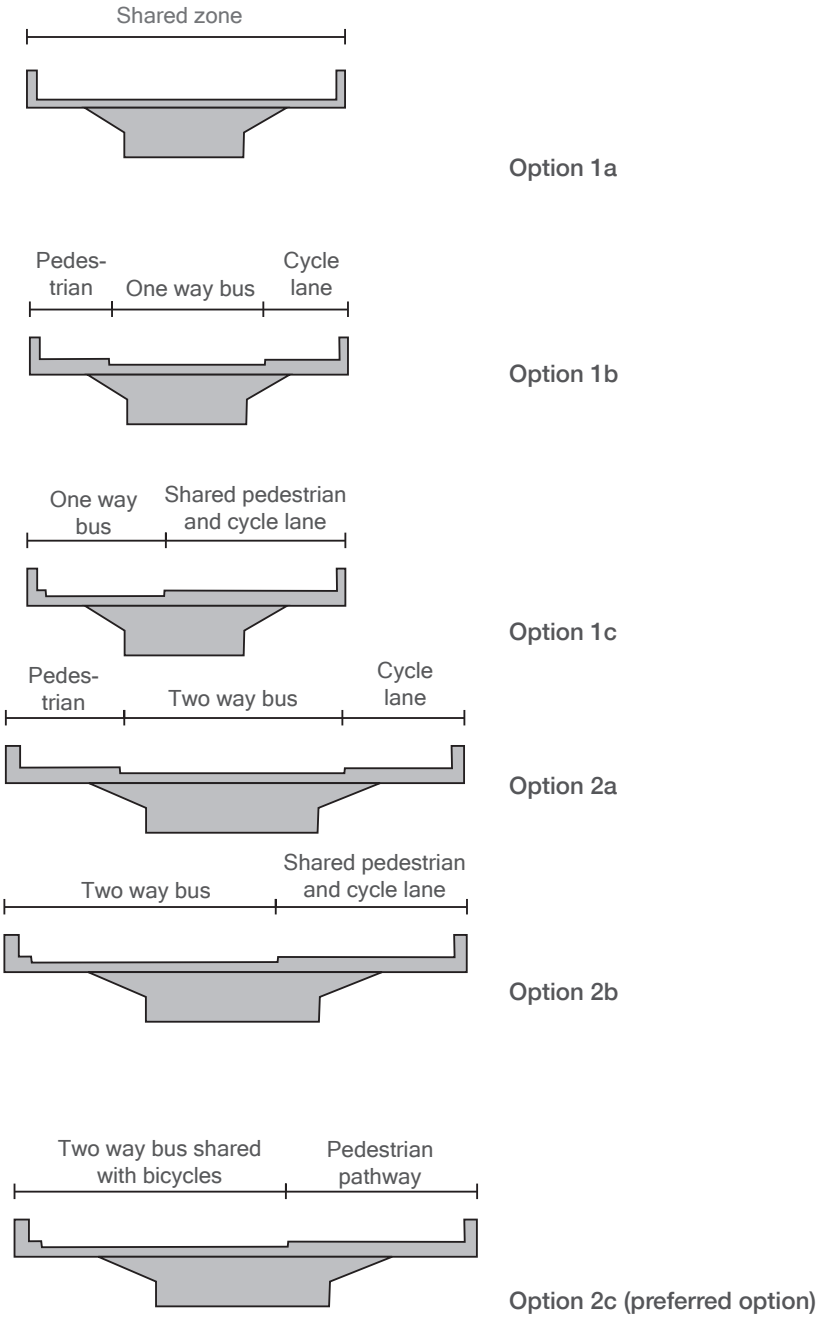


Figure 3.7 – Lane configuration options