



Homebush Bay Bridge | Environmental Assessment

APPENDIX G

Traffic management and access assessment report



Fairmead Business Pty Ltd

**Homebush Bay Bridge Traffic
Management and Access**

Report

22

Rev A | 16 January 2012

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1 Introduction

1.1 Introduction

Arup was commissioned by the landowners of the Wentworth Point sites by Fairmead Business Proprietary Ltd in January 2011 to conduct a traffic management and access and public domain assessment for the proposed Homebush Bay Bridge.

This traffic management and access and public domain assessment forms part of the Environmental Assessment that was required for planning approval under Part 3A of the Environmental Planning and Assessment Act 1979.

A separate Transport Management and Accessibility Plan (TMAP)¹ by others was prepared to consider the wider implications of proposed land uses in Wentworth Point.

The proposed Homebush Bay Bridge spans across Homebush Bay in western Sydney, connecting Wentworth Point, in the Auburn Local Government Area, on the west and Rhodes Peninsula, in Canada Bay Local Government Area, on the east.

1.2 Project objectives

The proposed Homebush Bay Bridge forms part of a wider master plan for the Wentworth Point area to become a prestigious new waterfront suburb.

The overall bridge project objectives are to;

- i. 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.
- ii. Encourage the use of transport options other than private motor vehicle in the Homebush Bay area.
- iii. Deliver a bridge design that fits with and contributes to Rhodes and Wentworth Point built forms, streetscapes, public domains and Homebush Bay recreational maritime activities.
- iv. Consider input from the community and key stakeholders into the development and design of the bridge.
- v. 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.

Travel from Wentworth Point to Rhodes or vice versa is currently via a circuitous seven kilometre long route via Sydney Olympic Park. The proposed bridge is to provide bus, pedestrian and cycling access for the two emerging communities to

¹ Draft Wentworth Point TMAP, Cattell Cooper, December 2011

enable connectivity and access to retail services, open space, public transport and community services. Key objectives of the Homebush Bay Bridge specific to transport are to provide or improve:

- Local pedestrian access;
- Regional pedestrian access;
- Equitable access and allow for personal mobility device access including wheelchairs, electric gophers etc;
- Local cycling access;
- Regional cycling access;
- A feeder links into Rhodes rail station and regional bus routes that extend to connect those within a nominal 800 metre walking catchment and a nominal 2 kilometre cycling catchment;
- A feeder links to the Sydney Olympic Park ferry wharf;
- A connection to potential community services e.g schools on Wentworth Point;
- A feeder link to serve local purposes e.g. shopping and school for an immediate 400m walking catchment;
- A link into the wider metropolitan bus routes and bus transitway network ;
- Access for maintenance vehicles and street sweepers; and
- Access for emergency vehicles..

1.3 Purpose of This Report

The purpose of this study and report is to:

- Respond to the Department of Planning and Infrastructure Director General's Requirements² in relation to transport, traffic management and access and public domain impact;
- Provide an assessment that is to be included in the Environmental Assessment of the bridge;
- Provide design direction for design of the bridge;
- Understand the bridge in its context;
- Summarise and incorporate into the design the transport outcomes of extensive consultation undertaken by the proponents and the design team with the local community and government authorities;
- Understand the future population and context of the Homebush Bay area;
- Understand how the bridge would contribute to the area and wider community from a connectivity and sustainability perspective, responding to the goals of the NSW Government, Sydney Olympic Park Authority (SOPA), Auburn Council and Canada Bay Council;
- Assess key issues and highlight requirements and standards that need to be incorporated into the bridge design concept;
- Assess impacts of the bridge operation and construction on traffic and pedestrian and cyclists; and
- Identify mitigation and management measures for the proposed bridge and associated construction works.

² Director General's Requirements (DGRs) for Homebush Bay Bridge (10_0192) issued on 21st December 2010.

1.4 Director General's Requirements

Director General's Requirements (DGRs) for Homebush Bay Bridge (10_0192) were issued on 21st December 2010. The Director General's Requirements relating to transport are shown in Table 1.

Table 1: Director General Requirements relating to transport and access.

No.	Director General Requirements	Relevant Section in this Report
9	Demonstrate how the project facilitates the efficient movement of public transport services to meet the needs of existing and future residents served by the proposal, including the needs of special events at Sydney Olympic Park, having regard to efficient travel speed and road safety; and	Section 8: Impact on connectivity, Section 10: Potential bus service. This assessment does not include the bridge to be used for events. If SOPA choose to utilise the bridge for events, this would be a separate assessment process.
10	Demonstrate how the project would quantitatively contribute towards achieving the NSW Government targets of increasing the share of commuter trips made by public transport (to and from the Sydney CBD and to and from Parramatta CBD), increasing the proportion of total journeys to work by public transport in the Sydney Metropolitan Region and increasing the mode share of bicycle trips;	Section 9: Impact on travel journey to work.
11	Details of the short, medium and long term population that form the potential catchment for potential use of the bridge for walking, cycling and public transport;	Section 5: Future context
12	The number of public transport services required to meet the NSW State Plan targets for public transport use and local needs. Cross regional bus services should be specifically considered and accommodated now and into the future	Section 8: Impact on connectivity, Section 9: Impact on travel journey to work and Section 10: Potential bus service
13	Details of the existing and future transport networks, traffic generation and circulation (existing and future) on the surrounding road network, with particular attention given to traffic and access connections to Rhodes, Wentworth Point and the Sydney Olympic Park precinct, and the broader Sydney metropolitan area	Section 4: Existing Context. Section 8: Impact on connectivity
14	Details of the traffic volumes likely to be generated during construction and operation, and an assessment of the predicted impacts of this traffic on the safety and capacity of the surrounding road network, including access to Concord Road and Homebush Bay Drive	Section 11: Construction Traffic Management Plan
15	Details of the proposed traffic management measures to prevent simultaneous two-way movement and usage by other motor vehicles and safety of pedestrians and cyclists using the bridge;	Section 7: Proposed Homebush Bay Bridge concept design. The design of the bridge has been altered since the Preliminary Environmental Assessment to be

		designed as a two lane bus bridge, hence management measures to prevent simultaneous two – way movements is not addressed. Measures to restrict other motor vehicles using the bridge are addressed in Section 7.
16	Details and analysis of the proposed access to the project, in particular the suitability and capacity of local roads for use by regular public transport services, and the level of service of key intersections;	Section 10: Potential bus service.
17	Construction traffic access to the project and associated management measures	Section 11: Construction Traffic Management Plan
35	Integration of the bridge with existing and future pedestrian and cycle network in the local, regional and metropolitan context;	Section 7: Proposed Homebush Bay Bridge concept design and Section 8: Impact on Connectivity
36	Impact of the bridge ramps on existing and future shared use pedestrian and cycle access along the foreshore of Wentworth Point and Rhodes; and	Section 7: Proposed Homebush Bay Bridge concept design
37	Consideration of design, and safety measures for pedestrian and cycle access on the bridge	Section 7: Proposed Homebush Bay Bridge concept design
40	The Environmental Assessment must reflect an appropriate and justified level of consultation with relevant stakeholders during the preparation of the Environmental Assessment, including; - Department of Environment, Climate Change and Water - NSW Maritime; - Transport NSW; - Sydney Olympic Park Authority; - NSW Roads and Traffic Authority; - City Rail; - Industry and Investment of NSW; - NSW Office of Water; - City of Canada Bay Council; - Auburn City Council; - Specialist interest groups, the public and affected landowners	Section 6: Consultation

This report addresses these DGRs.

2 Site description

2.1 Location

The Homebush Bay Bridge project is located across Homebush Bay, on the north eastern edge of Sydney Olympic Park (Figure 1). The Homebush Bay area is situated near the physical centre of the Sydney Metropolitan Area, and is approximately 12 kilometres from the Sydney CBD and approximately 7 kilometres from Parramatta. The site is described below at an immediate context and secondary context level.

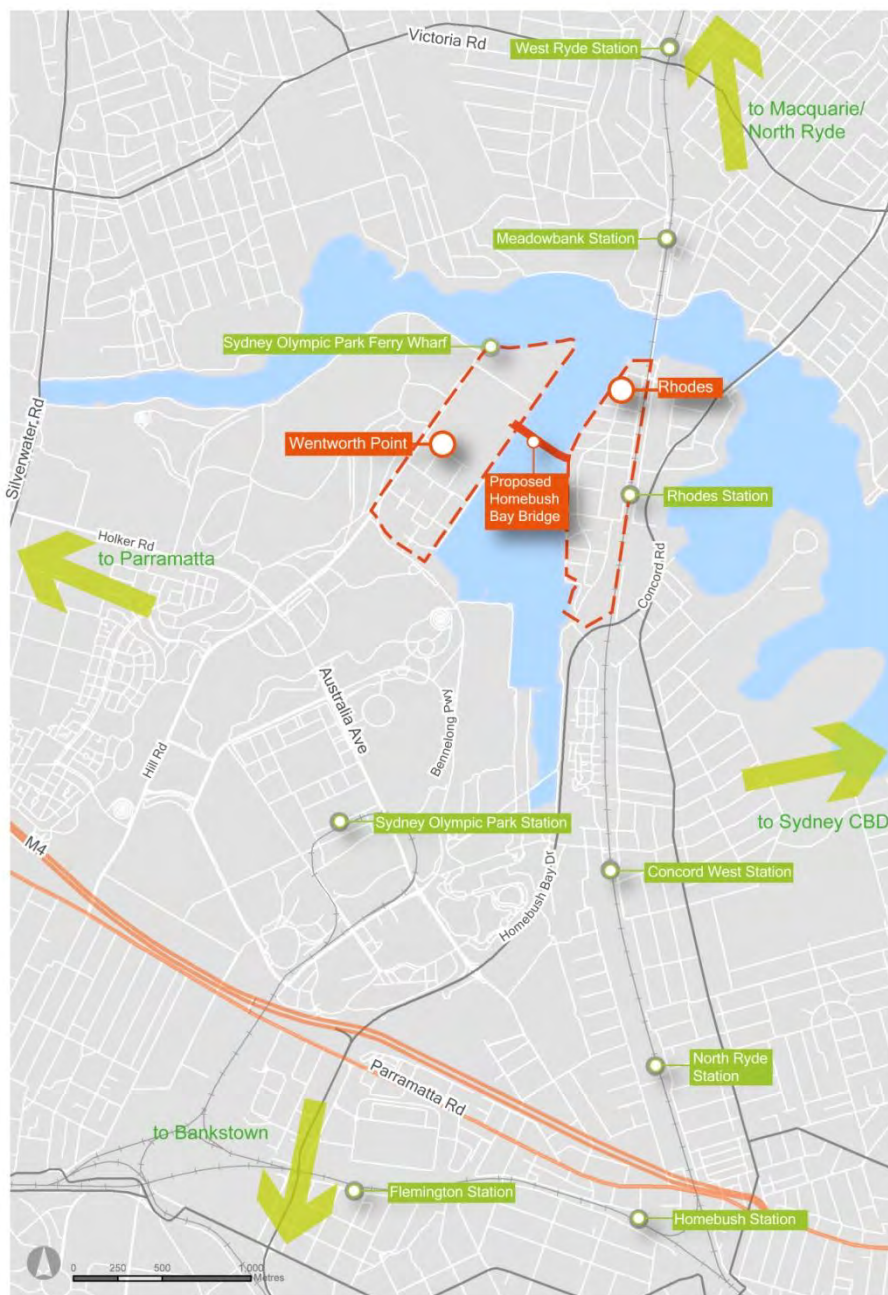


Figure 1: Site Location

2.2 Immediate context

The bridge project crosses three legal tenures (Figure 2). These include:

- Lot 122 DP 1156412 on Wentworth Point – the western landing point of the proposed bridge;
- Lot 310 DP 1163025, on the Rhodes Peninsula – the eastern landing point of the proposed bridge; and
- Homebush Bay – under NSW Maritime Authority.

The proposed bridge in its local context is shown below.



Figure 2: Immediate Context

2.3 Secondary context

The secondary context of the proposed Homebush Bay Bridge can be characterised as four precincts (Figure 3). Precincts were defined with respect to Travel Zone boundaries. Travel Zone boundaries are geographic areas defined by the Transport Data Centre. Travel Zones are smaller than Statistical Local Areas but generally larger than Census Collector Districts and have specific transport characteristics, i.e. they usually have only one freeway or transport interchange:

1. Wentworth Point Precinct: This precinct includes the western landing point of the bridge with the land between Hill Road and Homebush Bay. This precinct follows the Travel Zone boundary of Travel Zone 1613. The southern portion of the Wentworth Point has been recently developed with a series of residential buildings. Northern portions of the Wentworth Point area are proposed to be developed into a boat shed and community facility with residential and retail development surrounding the Homebush Bay ferry stop. The middle portion of Wentworth Point is currently occupied with warehouses and is proposed to be redeveloped for residential uses.

2. Rhodes West Precinct: This precinct includes the eastern landing point of the bridge, covering the land in between the rail line and Homebush Bay. This precinct follows the Travel Zone boundary of Travel Zone 1499. This precinct has undergone significant change from an industrial district to a residential and retail precinct. A series of residential developments and the Rhodes Shopping Centre have been completed in recent years, and the northern area of the precinct is currently under construction to deliver more apartment buildings.

3. Sydney Olympic Park Precinct: This precinct includes the land that is managed and operated by the Sydney Olympic Park Authority, lying south of the proposed bridge. The Sydney Olympic Park Precinct includes the sporting facilities and stadia that were used for the 2000 Olympic Games as well as the Sydney Olympic Park rail station (approximately 3.5 kilometres from Wentworth Point)

4. Rhodes East Precinct: This precinct is situated east from the proposed bridge, covering the land in between the rail line and Concord Road. This precinct is characterised by the commercial uses of Rhodes Corporate Park to the south and low to medium density residential uses to the north.



Figure 3: Secondary context.

3 Planning and policy context

3.1 State planning context

3.1.1 NSW 2021

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.’*

Commentary

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.

3.1.2 NSW Government’s Metropolitan Strategy – City of Cities (2005)

The *Sydney Metropolitan Strategy - City of Cities* is a strategic planning document that provides a broad framework for the growth and development of Sydney towards 2031. It outlines the vision, challenges and directions facing Sydney in relation to: Economy and Employment, Centres and Corridors, Housing, Transport, Environment and Resources, Parks and Public Places and Implementation and Governance. The *Strategy* identifies five aims including:

- Enhance liveability.
- Strengthen economic competitiveness.
- Ensure fairness.
- Protect the environment.
- Improve governance.

NSW Government’s Metropolitan Plan for Sydney 2036 (2010)

The NSW Government updated the *Metropolitan Plan for Sydney* in 2010 to review the *Sydney Metropolitan Strategy* (2005) and ensure that it is responding to the challenges facing Sydney. The *Metropolitan Plan for Sydney 2036* is founded by the following policy settings:

- Establish no new greenfield fronts to Sydney's existing urban footprint under the Plan.
- Increase the proportion of homes within 30 minutes by public transport of jobs 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 Plan for Sydney 2036* highlights the importance of integrating transport and land use planning to overcome Sydney's challenges of managing congestion and reducing Sydney's energy related greenhouse gas emissions.

The current plan updates the dwelling and employment targets for Sydney's subregions as shown in the table below.

Table 2: Dwelling and Employment Targets (Source: DoP, 2010)

Subregion	Net Additional Dwelling Target 2036 (Metropolitan Plan for Sydney 2036-2010)	Net Additional Dwelling Target 2031 (Sydney Metropolitan Plan - 2005)	Net Additional Employment target 2036 (Metropolitan Plan for Sydney 2036-2010)	Net Additional Employment target 2031 (Sydney Metropolitan Plan - 2005)
Inner West	+ 35,000	+ 21,000	+ 25,000	+ 13,500
West Central	+ 96,000	+ 95,500	+ 98,000	+61,000

Dwelling and employment targets at the LGA level and updates to Subregional Plans have not yet been released.

Draft Inner West and West Central Subregional Strategy (2007)

Under the *Sydney Metropolitan Strategy*, the proposed bridge lies within the Inner West Subregion.

The *Subregional Strategies* translate directions from the *Sydney Metropolitan Strategy* to the local level by using a subregional approach. The *Draft Inner West Subregional Strategy* and *Draft West Central Subregional Strategy* have been prepared by State Government with collaboration with local councils and key stakeholders as a guide for long – term planning for the Ashfield, Canada Bay, Burwood, Leichhardt, Strathfield, Parramatta, Bankstown, Auburn, Fairfield and Holroyd LGAs.

Olympic Park – Rhodes is identified as a 'specialised centre' within subregions being „two of the largest brownfield redevelopment sites in metropolitan Sydney.” Specialised centres are 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.”



Figure 4: Extract from the Sydney Metropolitan Strategy (Department of Planning, 2005)

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. The Olympic Park area provides the potential to host higher levels of employment growth. 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.

The *draft Inner subregional West Strategy* and *draft Central West subregional Strategy* highlight the following relevant to the proposed Homebush Bay Bridge:

- **Transport:**

This chapter 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 would accommodate a significant number of residential dwellings, to meet subregional housing targets by 2031.

- **Environment, Heritage and Resources:**

The Millennium Parklands of Sydney Olympic Park are identified as a large regional open space within the subregions. 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.

Commentary

The *draft Inner West Subregional Strategy* and *draft West Central Subregional Strategy* highlight the need for infrastructure to respond to the changing land use in the areas two subregional areas, with emphasis on the need to improve local connections to provide links between local centres and to larger town centres.

Providing improvements to access to the Millennium Parklands of Sydney Olympic Park is identified as a key mechanism to enable the community to acknowledge the value of these lands.

3.1.3 Metropolitan Transport Plan – Connecting the City of Cities (2010)

The *Metropolitan Transport Plan* sits under the *NSW State Plan 2010* to deliver a key vision for Sydney's transport. The four key vision statements are:

- Commuting to work easily and quickly.
- Transport and services accessible to all members of our community.
- An efficient, integrated and customer focused public transport system.
- Revitalised neighbourhoods with improved transport hubs.

The *Metropolitan Transport Plan* highlights the role of transport in Sydney as needing to go beyond catering for growth to being able to contribute to shaping a compact and efficient city. The *Metropolitan Transport Plan* is shown in Figure 5.



Figure 5: Metropolitan Transport Plan. Source: NSW Government, 2010.

Bus

The *Sydney Metropolitan Strategy* identified a network of fast, frequent, direct and convenient bus services on ‘strategic’ bus corridors that connect centres across Sydney. 43 strategic bus corridor services were identified through the plan that are intended to link Sydney’s major centres and services. Strategic bus corridor 39: Burwood to Macquarie Park passes through Rhodes. The proposed Homebush Bay Bridge provides a link for patrons to access the future regional bus connections.

Commentary

The proposed Homebush Bay Bridge aligns with the key elements of the *Metropolitan Transport Plan* as the bridge supports improved access to open space and public transport to provide increased opportunities to enhance the social and economic value of both communities. The proposed Homebush Bay Bridge also provides a connection for Wentworth Point residents to access the future bus corridor from Burwood to Macquarie Park.

3.1.4 The Integrated Land Use and Transport package, DUAP 2001

The *Integrated Land Use and Transport Package* provides a guidance to apply the objective of ‘promoting attractive and convenient places to live and work’ at a local level. This *Package* emphasises the need for urban structures, building forms, land use location, development designs, subdivision and street layouts to achieve sustainable transport objectives. The *Package* 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 and waiting 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).

Commentary

The concepts highlighted throughout the *Integrated Land use and Transport Package* have guided the development of the bridge design concept and bridge landing concepts in both communities.

3.1.5 Draft NSW Walking Strategy 2011

The *Draft NSW Walking Strategy* is currently under development, guided by the Premiers Council for Active Living (PCAL) and is expected to be ready for release in early 2011. A series of supporting documents have been developed to inform the Walking Strategy, the key issues are as follows:

- There is opportunity to shift a high number of short trips to walking trips by better planning and considering design of the built environment to encourage walking trips and integrate walking into everyday lifestyles.
- Walking is important for being healthy and undertaking physical exercise daily.
- 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 of walking environment (and low level of service) in Sydney

Commentary

The issues identified in the supporting studies for the *NSW Walking Strategy 2011* align with the the proposed Homebush Bay Bridge as the bridge seeks to encourage walking:

- for recreation;
- As a mode for travel to work;
- For access to public transport (Rhodes rail station and Homebush Bay ferry stop)
- To access services including the proposed school at Wentworth Point, rowing facilities at Wentworth Point and retail services at Rhodes shopping centre.

3.1.6 NSW BikePlan, NSW Government 2010

The *NSW BikePlan* outlines an approach to promoting cycling through not only infrastructure, but also social programs and policy initiatives. The *Plan* is a ten year plan that covers funding for bicycle infrastructure across NSW and a series of encouragement programs.

The Metro Sydney Bike Network as outlined by the *NSW BikePlan (2010)* is shown in Figure 6. The Bike Network identifies a proposed bike route through Homebush Bay west to connect to the existing bike routes in Olympic Park and through Rhodes.

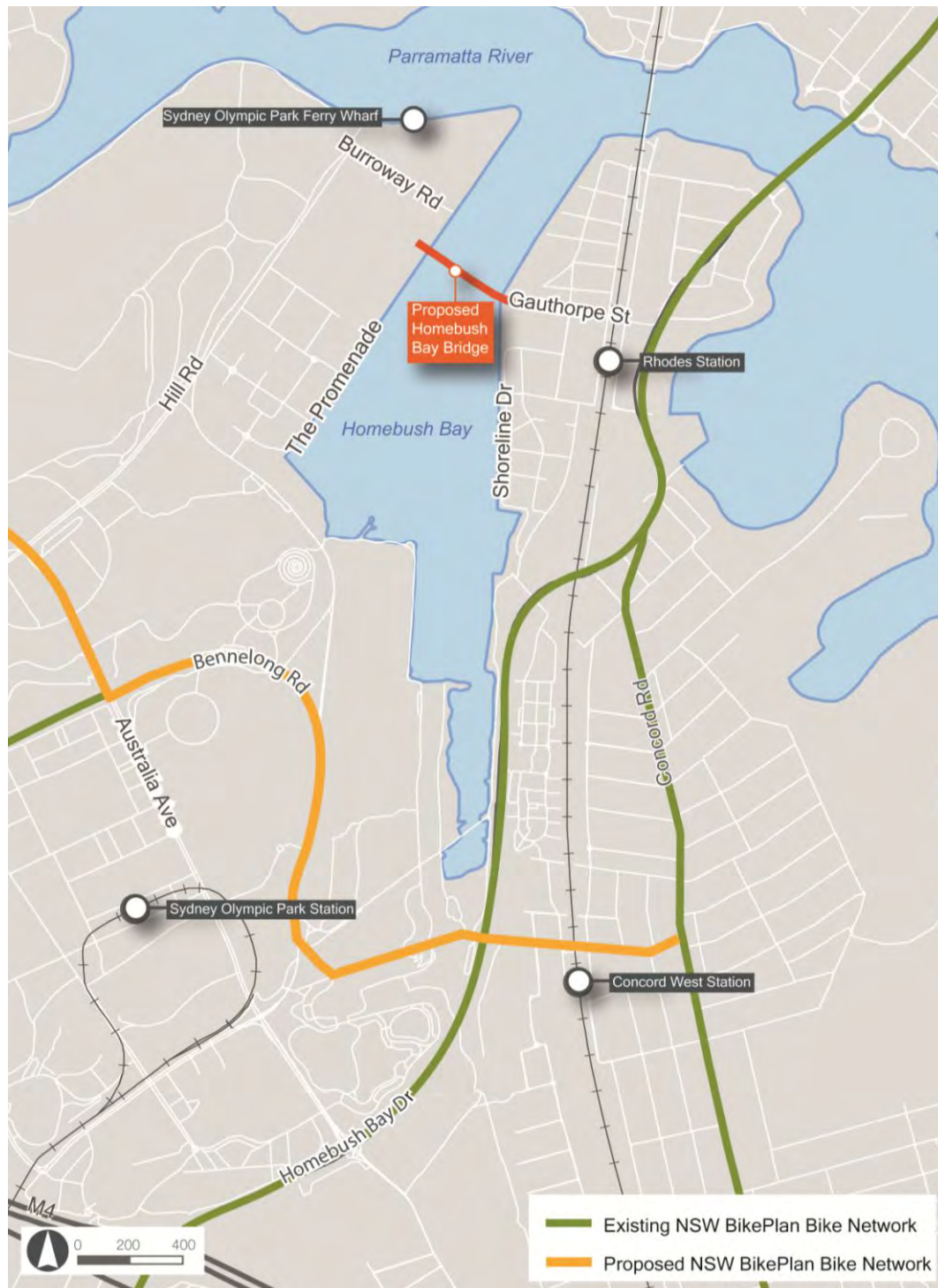


Figure 6: Extract of the Metro Sydney Bike Network. Source: NSW BikePlan 2010

Commentary

The proposed Homebush Bay Bridge provides local and regional cycling connections and proposes to integrate into existing and proposed bike routes identified by the *NSW BikePlan*. As a bridge that provides access to pedestrians, cyclists and public transport only, the bridge seeks to promote mode shifts from private vehicles to walking and cycling.

3.1.7 Service Planning Guidelines, Ministry of Transport, 2006

In 2003 the Minister for Transport Services commissioned an inquiry into the NSW Bus Industry to provide a framework to work towards improving the efficiency and effectiveness of the bus industry. The *Service Planning Guidelines (2006)* were developed to respond to the inquiry that highlighted the need to improve strategic guidance from government into the bus industry to ensure the bus industry is responding more closely to metropolitan planning and environmental objectives for the Sydney metropolitan region.

Commentary

The *Service Planning Guidelines (2006)* provides guidance for the initial assessment of the potential bus service to run along the Homebush Bay Bridge.

3.2 Regional and local planning context

3.2.1 Sharing Sydney Harbour Access Plan, NSW DIPNR, 2003

The *Access Plan* responds to the need for the Sydney Harbour foreshore to be accessible 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

“to 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 *Sharing Sydney Harbour 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 7.



Figure 7: Extract from the Access Improvements, Source: Sharing Sydney Harbour Access Plan, 2003

Proposals outlined for Homebush Bay include:

- Proposed cycleway along the foreshore of Wentworth Point and Rhodes, connected by a bridge across Homebush Bay.
- New wharfs/ pontoons for Homebush Bay west.
- New boat ramp for Homebush Bay west.

Commentary

The *Sharing Sydney Harbour Access Plan* identifies the bridge link across Homebush Bay of high importance to improve connectivity between Rhodes and Wentworth Point, access to Sydney Harbour and contribute the wider network for Sydney Harbour.

3.2.2 Sydney Olympic Park Masterplan 2030, SOPA 2010

The *Sydney Olympic Park Masterplan 2030* provides guidelines and controls for development of the Sydney Olympic Park. The land covered by the *Sydney Olympic Park Masterplan* includes the areas marked in yellow in Figure 8.



Figure 8: Sydney Olympic Park Masterplan 2030 land. Source: Sydney Olympic Park Masterplan 2030

Transport issues addressed within the Masterplan include:

- Target journey to work mode split of 40% to non – car modes.
- Pedestrian/ bike mode split of 10%.
- Intersection upgrades are earmarked for Hill Road/ Bennelong Road.

The Masterplan identifies a series of proposed and existing pedestrian and cycling routes, displayed in Figure 9.

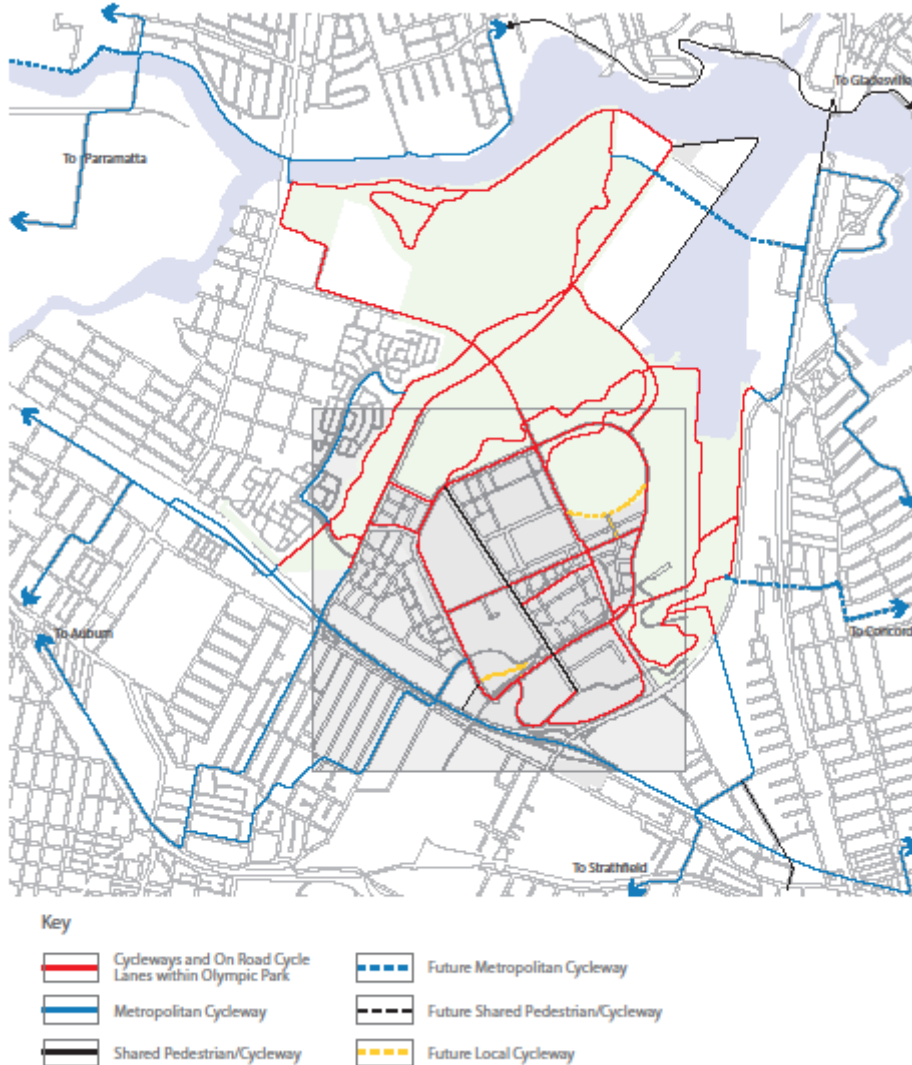


Figure 9: Pedestrian and cycle routes for Sydney Olympic Park. Source: Sydney Olympic Park Masterplan 2030.

Commentary

Although the Masterplan directly governs the area outlined in Figure 8 the Masterplan recognises that transport and access issues affecting the area extend beyond the immediate Masterplan area. One of the key access and transport issues highlighted by the Masterplan is to *–integrate transport service planning with adjacent suburbs, especially to reduce the reliance on private vehicle use for trips under 5 kilometres.*” The Masterplan identifies the link between Homebush Bay west and Rhodes as key element in the transport network to meet transport and

access targets and enhance the communities as well as support Sydney Olympic Park.

3.2.3 Sydney Olympic Park Masterplan – Wentworth Point, SOPA 2010

The land to the north of Wentworth Point (as outlined in Figure 10) lies within SOPA control. This area currently includes the Homebush Bay Ferry Wharf, a bus terminal and public park. The *Sydney Olympic Park Masterplan – Wentworth Point* outlines a plan for the area to become a mixed use interchange area with retail, commercial and residential uses.



Figure 10: Wentworth Point - SOPA land, Source: SOP Masterplan - Wentworth Point, SOPA 2010

Commentary

Access to the ferry wharf and associated enhancements to the Wentworth Point area have been considered in the design and assessment of the Homebush Bay Bridge.

3.2.4 Sydney Regional Environmental Plan No. 24 – Homebush Bay

The *Sydney Regional Environmental Plan No. 24 – Homebush Bay* currently applies to the Homebush Bay Area and the majority of the Wentworth Point land. Under the *Sydney Regional Environmental Plan No. 24 – Homebush Bay* the following local planning controls apply to the western landing point of the proposed Homebush Bay Bridge;

- Homebush Bay West DCP, June 2004;
- No. 1 Burroway Road (deemed) DCP 2006; and
- Homebush Bay Wentworth Point Masterplan 2005.

3.2.5 Auburn Council Planning Controls

Homebush Bay West DCP, Auburn Council

The *Homebush Bay West DCP* provides a framework for the ongoing renewal of Wentworth Point. The *DCP* outlines the following floor space controls for Wentworth Point.

Table 3 Wentworth Point Built Form Controls.

Precinct	Site are (m ²)	Allowable floor space	Commercial/ maritime/ educational floor space minimum	Retail/ café/ dining associated with waterfront	Residential floor space maximum	Open space minimum
A	203,482	264,527	29,115	300	11,882	49,800
B	109,730	142,649	3,165	100	139,384	10,973
C	31,946	41,530	0	100	41,430	3,195
D	62,375	81,087	405	200	80,482	6,237
E	50,753	65,979	330	100	65,549	5,075
F	182,186	236,842	2,000	200	234,642	18,219
Totals	640,472	832,614	35,015	1,000	573,369	93,499

Source: Homebush Bay West DCP. 2004.



Figure 11: Staging for Development in Wentworth Point

The proposed street network and the open space and public domain features of this *DCP* refer the possibility of a bridge link across Homebush Bay. The features of the street network are summarised in Table 4 and Figure 12.

Table 4: Street Network.

Street Type	Carriageway	Character
Primary – Hill Road	2 travelling lanes 2 separated dedicated bicycle lanes 1 parking lane	Main entry to Homebush Bay West precinct, connecting Sydney Olympic Parklands and the Millennium Marker.
Major east – west streets	1 travelling lane 1 parking lane in each direction	Provide east – west links from Hill Road to the promenade.
Secondary streets	2 travelling lanes 1 parking lane	Connecting primary streets and provide access primarily for pedestrians and cyclists.
Promenade	One way – 1 travel land and 1 parking lane on the west side	Emphasises a predominantly pedestrian environment.

Source: Adapted from Homebush Bay West DCP, 2004



Figure 12: Wentworth Point Street Network, Adapted from Homebush Bay West DCP 2004

Commentary

The design of the street network and open space complements the proposed Homebush Bay Bridge, continuing the strong east – west link from Hill Road to the Promenade and Rhodes. The street network also suggests that it is able to accommodate a shuttle bus along the major and secondary streets.

Homebush Bay Wentworth Point Masterplan 2005

The *Homebush Bay Wentworth Point Masterplan 2005* applies to the land at the northern tip of Wentworth Point as shown in Figure 13. The *Masterplan* outlines the future development of the area to include:

- Maritime uses
- Aboriginal Cultural centre
- Retail/ Commercial centre
- Ferry terminal
- Foreshore Open Space



Figure 13: Land to which the Homebush Bay Wentworth Point Masterplan 2005 applies.

Commentary

The *Homebush Bay Wentworth Point Masterplan 2005* provides detailed guidelines to the selected Wentworth Point area (as shown in Figure 13) and is consistent with the *Homebush Bay West DCP 2004*. The proposed future uses for the Wentworth Point area suggest the area will be a key node, attracting and generating pedestrians, cyclists and patrons of the proposed bus service.

3.2.6 Canada Bay planning controls

Rhodes West DCP, 2011 Canada Bay Council

The *Rhodes West DCP, 2011* integrates relevant controls from *Sydney Regional Environmental Plan – 29 Rhodes* and *Renewing Rhodes DCP 2000* (to be superseded by this DCP). The *Rhodes West DCP 2010* seeks to guide development of Rhodes West into a high quality residential and high technology commercial office centre.

The *DCP* has a focus on the ecological and environmental benefits the renewal of the Rhodes area will bring. The *DCP* therefore has strong foundations in the provision of open space and social infrastructure as well as connections to these facilities.

Gauthorpe Street is recognised within the *DCP* as a link from Walker Street to the foreshore and landing of the future Homebush Bay pedestrian and cycle bridge.

The street network, open space and community facilities outlined in the *DCP* are shown in Figure 14.



Figure 14: Rhodes West DCP Framework Plan. Source: City of Canada Bay, Rhodes West Draft DCP.

Commentary

The design of the proposed Homebush Bay Bridge would respond closely to the pedestrian connections to community facilities, foreshore walk, plaza, open space and transport facilities.

3.3 Other studies

A number of recent transport studies have been completed for the Wentworth Point area. These have been referenced where relevant and have contributed to an understanding of the transport issues relating to the proposed bridge.

These include:

- Cattell Cooper, December 2011, ‘Wentworth Point Transport Management and Accessibility Plan.’ (Appendix C)
- Urban Futures Group, August 2010, ‘Homebush Bay Bridge, Preliminary Environmental Assessment Report’
- Scott Carver, August 2010, ‘Wentworth Point Urban Design Review’
- Traffix, August 2010, ‘Traffic Impact Assessment – Wentworth Point Maritime Precinct Concept Plan, Wentworth Point, Homebush Bay’
- Traffic and Transport Planning Associates, May 2010, ‘Meriton Apartments, Proposed Residential Apartment Development Lot 101 and 102 Walker St, Rhodes Assessment of Traffic and Parking Implications report’
- SCAPE, July 2010, ‘Wentworth Point Strategic Transport Review’
- Payce, April 2009, ‘Wentworth Point Vision 2010’
- Pbai, October 2005, ‘Homebush Bay West Bridge Transport Assessment’
- Maunsell, 2003, ‘Homebush Bay West Masterplan Preferred Option Transport Report’
- Maunsell for Planning NSW, November 2002, ‘Carter Street and Sydney Olympic Park TMAP Final Report’

4 Existing context

4.1 Transport context

The Homebush Bay area's history has shaped its current transport context. Homebush Bay was used as the site for the State Brickworks in the early 1900s. Chemical industries were set up in the Rhodes Peninsula area in the 1920s, producing pesticides that had heavily polluting by-products that were dumped in Homebush Bay and surrounding land. Up until the early 1990s, the areas around Homebush Bay experienced both controlled and uncontrolled waste dumping, transforming the wetland area into a heavily polluted waterway. The lack of connectivity into and out of the area responded to the industrial uses of the Homebush Bay area up until the early 1990s.

The announcement of the 2000 Sydney Olympic Games centred on Homebush Bay triggered significant remediation for Homebush Bay and the area that the Olympic venues would cover. From a transport perspective, the Homebush Bay area was again designed as an isolated destination to allow the Olympic site to operate very efficiently in an event mode.

The main railways from Sydney to the west are located south of Homebush Bay, and the main railway to the north is west of Homebush Bay through the Rhodes peninsula. Options to replace the freight sidings at Homebush with a passenger line extending across the Parramatta River were not adopted; a passenger rail loop to serve only Sydney Olympic Park was constructed for the Olympics. Options to establish a transit or light rail service from the inner west or Strathfield to Parramatta were not adopted, most recently with the shelving of the proposed Sydney West Metro underground metro rail scheme designs. The development of the Sydney Metro roads System including Route 4, the M4 Motorway and Route 3, Homebush Bay Drive reinforced the bypasses of the area.

The history of the site has left the Homebush Bay area with limited access opportunities to support emerging communities on Rhodes Peninsula and Wentworth Point.

4.2 Existing travel behaviour

The existing travel context for the Homebush Bay area has been analysed using a series of previous studies where relevant and using ABS Census Data 2006, relating to the Travel Zones of Wentworth Point and Rhodes. Details and boundaries of the Travel Zones are shown in Table 5 and Figure 15. Analysis of existing travel patterns for the area contributes to an understanding of the potential transport needs and impacts of future development.

The review of existing travel behaviour recognises that the ABS Census (2006) data relates to development at Rhodes and Wentworth Point in 2006, and since then the residential population has increased and will continue to increase due to significant development planned for both areas. Further development in both areas will have significant impact on the needs for the area.

Table 5: Relevant ABS 2006 Census Travel Zones.

Area	ABS 2006 Census Travel Zone
Wentworth Point	1613
Rhodes	1499

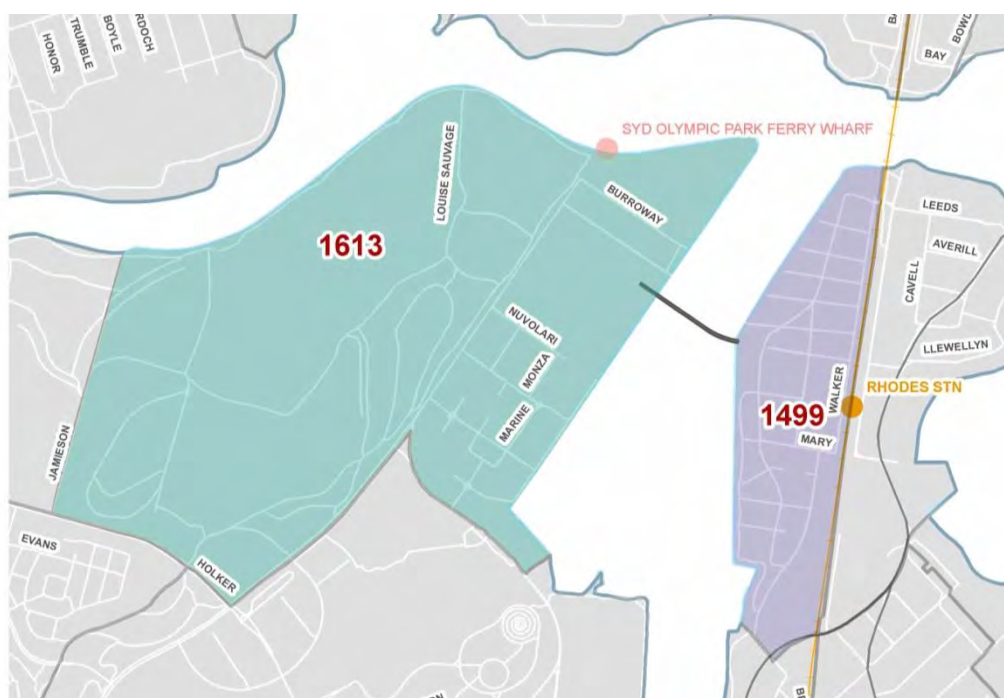


Figure 15: Travel Zone boundaries

4.2.1 Transport mode split

In 2006, Wentworth Point had a total population of 1,363 people. For those that travel to work from Wentworth Point, the dominant form of travel was by car (83%), as either the driver or passenger or truck as shown in Table 6. Train was the second highest mode of transport to work (10%). The proportion of people in Wentworth Point travelling to work by ferry (2%) reflects the presence of Sydney Olympic Park Ferry Wharf at the north of Wentworth Point.

Table 6: Wentworth Point Travel Zone Mode Share. Source: ABS, 2006

Description of Mode (one method)	Total	%
Train	74	10%
Bus	8	1%
Ferry	14	2%
Car (car driver, car passenger, truck)	588	83%
Taxi	0	0%
Motorbike	0	0%
Bicycle	9	1%
Walked only	14	2%
Other	0	0%
Total	707	100%

Table 7: Rhodes Travel Zone Mode Split Data. Source: ABS, 2006.

Description of Mode (one method)	Total	%
Train	41	32%
Bus	0	0%
Ferry	0	0%
Car (car driver, car passenger, truck)	75	58%
Taxi	0	0%
Motorbike	0	0%
Bicycle	0	0%
Walked only	14	11%
Other	0	0%
Total	130	100%

In 2006, the Rhodes Travel Zone had a total population of 990 people. The most dominant form transport mode to access work was car, by car, car passenger or truck. 58% of those travelling to work in the Rhodes Travel Zone travelled by a private car base mode, as shown in Table 7. Travel to work by train represented 32% of journeys to work for the Rhodes Travel Zone. The high proportion of train travel can be related to Rhodes station being in close proximity to the residential uses of the Travel Zone. Rhodes also presented a high proportion of people travelling to work by 'walk only' (11%). This can be attributed to the Rhodes Corporate Park and Rhodes Shopping Centre being in close proximity to the Rhodes Travel Zone. In comparison to the Wentworth Point Travel Zone, the Rhodes Travel Zone displayed significantly lower journey to work travel by car based modes.

The analysis of existing mode split data for the two travel zones presents the opportunity for a shift in the future transport habits for the area towards non-car based transport modes. With the proposed development of the Homebush Bay Bridge, future residents of Wentworth Point would have greater access to Rhodes Station and hence uptake higher levels of journey to work by train. The proposed bridge would also provide walking and cycling access for the Wentworth Point

residents to the business and retail uses of Rhodes. The proposed bridge would provide greater access for the residents of Rhodes to access the Sydney Olympic Park Ferry Wharf and potentially shift a proportion of the car based travel to ferry journeys.

4.3 Vehicle access and patronage

4.3.1 Road access

The road network for the broader study area is shown in Figure 16. The broader study area includes the following major arterial roads:

- Parramatta Road and the M4 Motorway to the south;
- Homebush Bay Drive/ Centenary Drive to the east; and
- Silverwater Road to the west.

Homebush Bay Drive is a key arterial road that provides a link between the North Shore, Ryde, Rhodes, the south and the M4.

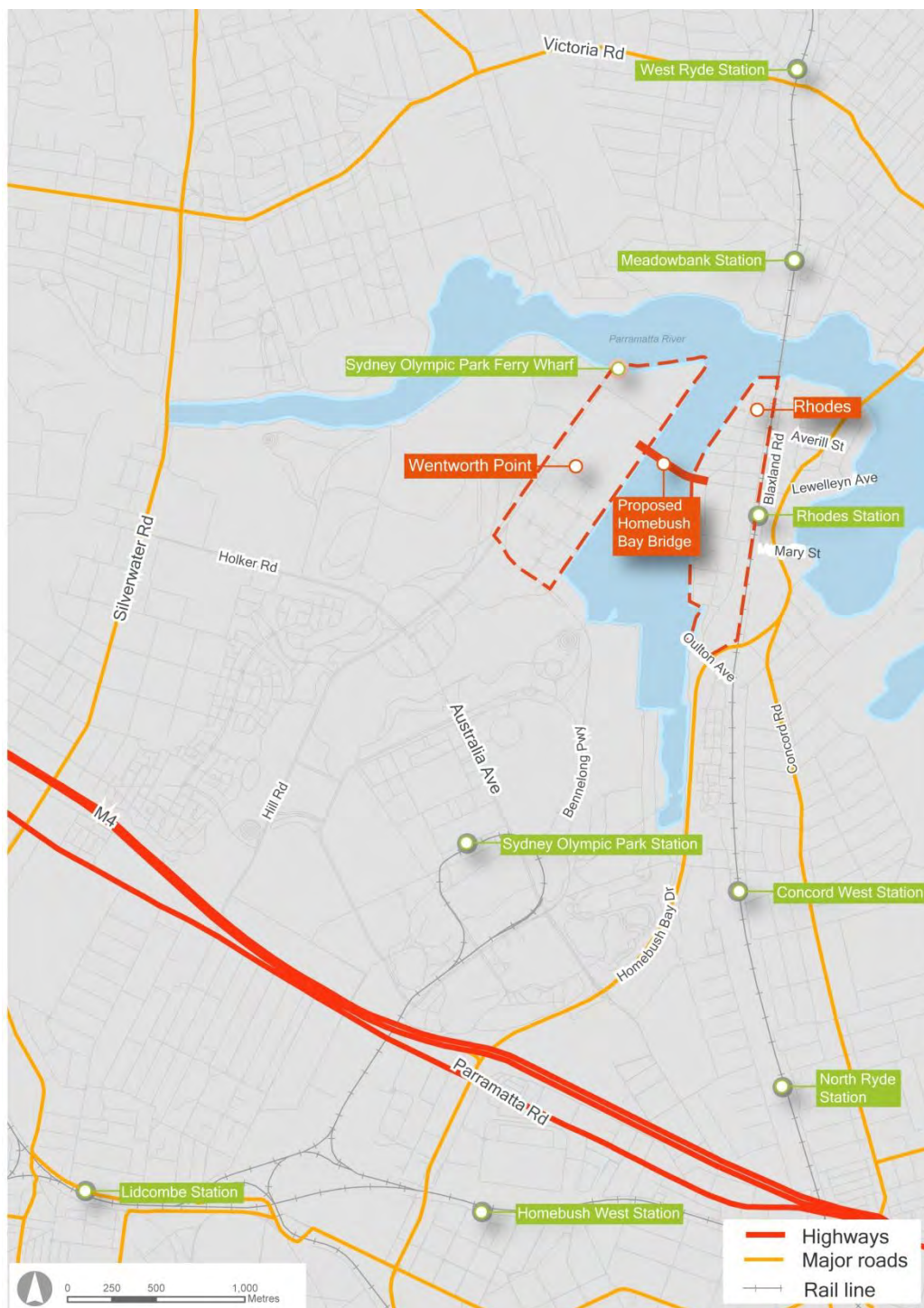


Figure 16: Road Network Plan

Wentworth Point

Wentworth Point has the following road characteristics:

- The M4 motorway (Metrod 4) provides vehicle connection between Wentworth Point and Parramatta, Penrith and the city.

- Wentworth Point is currently immediately serviced by Hill Road and Bennelong Parkway, connecting to Australia Avenue and Holker Street.
- Hill Road provides the single entry point to the northern areas of Wentworth Point.
- The southern area of Wentworth Point has a fine grain street network that responds to residential development in the area. A similar network is expected to be implemented in the remainder of the suburb to the north as existing legacy industrial use sites are redeveloped.
- Surrounding arterial roads and intersections into Sydney Olympic Park are currently susceptible to congestion and delays during peak periods.

Rhodes

Rhodes has the following road characteristics:

- Homebush Bay Drive (Metroad 3) provides a key arterial vehicle connection between Rhodes, Ryde, and the M4.
- Vehicle access to the local road network of western Rhodes is limited by the barrier of the rail line running north south.
- Key access points to Rhodes are off Homebush Bay Drive at Alfred Street and Oulton Avenue intersections to the south, and to the north at Lewelleyn/Blaxland Roads and Walker/Leeds/Averill Streets.

4.3.2 Road performance

An understanding of the road performance in the area was gained from existing reports undertaken for developments at Wentworth Point and Rhodes. The performance of an intersection is quantified in terms of Level of Service (Table 8), which is an index of the operational performance of traffic at an intersection and is based on the average delay per vehicle. LOS ranges from A = very good to F = highly congested travel conditions. Generally it is desirable to aim at achieving a Level of Service of C or better at all major road intersections. However, in practice, it is reasonable for some intersections to operate at Level of Service D at peak times.

Table 8: Level of Service Definitions

Description	Level of Service (RTA Definition)	Average Delay per Vehicle (s)
Very Good	A	< 14.5
Good	B	14.5 ≤ 28.5
Satisfactory	C	28.5 ≤ 42.5
Near Capacity	D	42.5 ≤ 56.5
At Capacity	E	56.5 ≤ 70.5
Over Capacity	F	≥ 70.5

Wentworth Point

The *Traffic Impact Assessment - Wentworth Point Precinct Maritime Concept Plan, Homebush Bay* (Traffix, July 2010) was produced to support the Part 3A Concept Plan application for the Wentworth Point Maritime Precinct. The *Traffic Impact Assessment - Wentworth Point Precinct Maritime Concept Plan, Homebush Bay* report provides a series of intersection analyses relating to the Wentworth Point area for existing AM and PM peak hours. These are shown in Table 9.

The results of the intersection surveys (Traffix, 2010) suggests that there are several intersections that are at capacity and or unacceptable with delays in both or either AM or PM peak periods. Intersections operating at capacity or at an unsatisfactory level include the following;

- Holker Street and Silverwater Road;
- Hill Road and M4 Off Ramp; and
- Hill Road and Great Western Highway and Bombay Street.

The intersection analysis is shown in Figure 17.

Table 9: Existing Intersection Performance. Source. Traffix, 2010

Intersection Description	Period	Level of Service	Control Type	Degree of Saturation	Intersection Delay
1. Hill and Bennelong Road	AM	B	Priority	0.33	7.5
	PM	B		0.41	7.3
2. Hill and Holker	AM	C	Signals	1.0	34.4
	PM	C		1.0	31.1
3. Holker and Silverwater	AM	F	Signals	1.5	>70
	PM	F		1.8	>70
4. Hill and M4 Off Ramp	AM	F	Priority	1.08	37.7
	PM	B		0.73	8.1
5. Hill and GWH and Bombay	AM	E	Signal	1.05	67.9
	PM	C		0.85	32.4

Rhodes

The *Meriton Apartments, Proposed Residential Apartment Development Lot 101 and 102 Walker St, Rhodes Assessment of Traffic and Parking Implications report* (Transport and Traffic Planning Associates, May 2010) provides a series of intersection analyses relating to the Rhodes area for AM and PM peak periods. The intersection results are shown in Table 10.

Table 10: Existing Intersection Performance at Rhodes.

Intersection Description	Period	Level of Service
1. Concord Road and Averill Avenue	AM	B
	PM	A
2. Concord Road and Mary Street	AM	B
	PM	C
3. Homebush Bay Drive and Oulton Avenue	AM	A
	PM	B

Source. Traffic and Transport Planning Associates, 2010

The road performance analysis suggests that the study area currently experiences areas with poor level of service during the peak periods causing congestion and delays. With the existing congested road environment, it will be crucial to provide viable alternative transport options to limit private vehicle use and limit further congestion impacts on the existing road network.

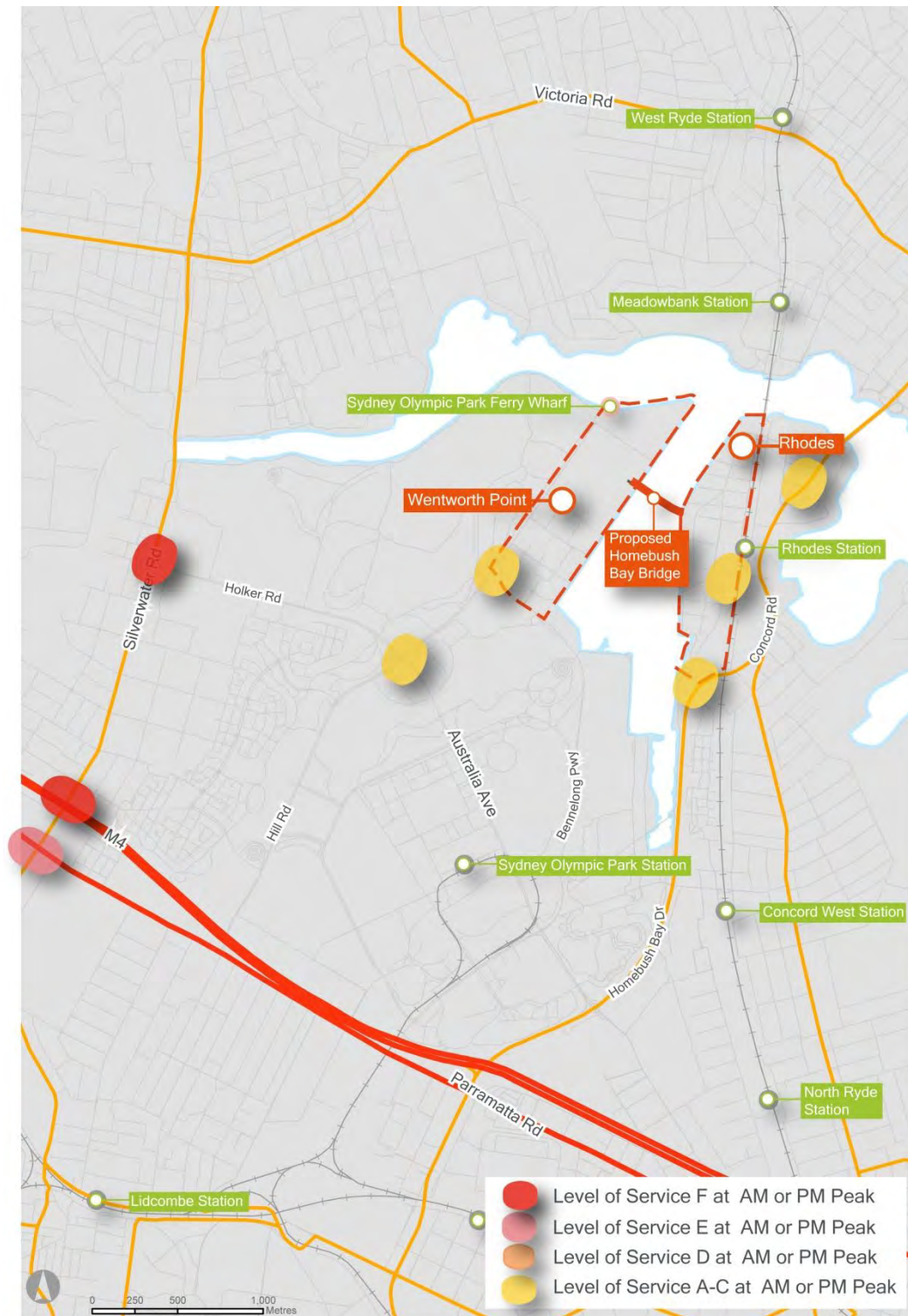


Figure 17: Existing road network performance at Wentworth Point. Data source: Traffix, 2010 and Traffic and Transport Planning Associates, 2010.

4.3.3 Rail services

The Homebush Bay area is served by Rhodes, Olympic Park and Concord West rail stations. Wentworth Point is currently isolated from the regional rail network, with Olympic Park station approximately 2.5 kilometres away. Rhodes rail station is within an 800m radius of the Wentworth Point area, however, due to the barrier of Homebush Bay and the Millennium Parklands, travel via the existing road network to Rhodes rail station is approximately 6.7 kilometres as shown in Figure 18.

Sydney Olympic Park Station

The Olympic Park Loop to and from Lidcombe Station has a train every 10 minutes in weekday peak times (7am – 9am); outside peak the loop service to Lidcombe Station departs Olympic Park Station approximately every 20 minutes.

Lidcombe Station provides rail access the Northern Line; Blue Mountains Line, Inner West Line; and South Line. From Lidcombe Station, trains direct from Lidcombe to City run approximately every 6 – 7 minutes in the AM peak time (7 am – 9 am). Trains from Lidcombe also provide direct rail access to Parramatta for a journey time of 10 minutes, running approximately every 7 to 10 minutes in the AM peak time.

Outside of peak times, trains from Lidcombe to the City run approximately every 9 to 14 minutes. Trains from Lidcombe to Parramatta run approximately every 13 to 20 minutes out of the peak period.

During event periods such as sports stadium events and Royal Easter Show a frequent direct service from Central to Olympic Park is provided.

Rhodes Station

Rhodes station lies on the Northern Line, providing access to direct rail travel between Hornsby and the City. During the AM peak (7am – 9am), trains from Rhodes to the City and Epping run every 15 minutes. Outside peak times, trains from Rhodes to the City run approximately every 30 minutes. Outside peak times, trains from Rhodes to Epping run approximately every 25 minutes.

Concord West Station

Concord West station lies on the Northern Line, connecting Sydney CBD and Hornsby via the inner west. Concord West station is approximately 6.5 km from Wentworth Point.

4.3.4 Ferry services

The Sydney Olympic Park Wharf is located on the northern edge of Wentworth Point along the Parramatta River. The ferry service provides public transport access along the Parramatta River connecting Parramatta Ferry Wharf and Circular Quay Wharf. The current ferry service journey time is approximately 50 minutes to Circular Quay and 30 minutes to Parramatta. From Olympic Park Ferry Wharf, ferry services run approximately every 25 minutes in the AM peak time.

Improving access between Rhodes and Wentworth Point provides residents in both precincts to gain access to increased public transport routes. Ferry services in the Homebush Bay area are shown in Figure 18.

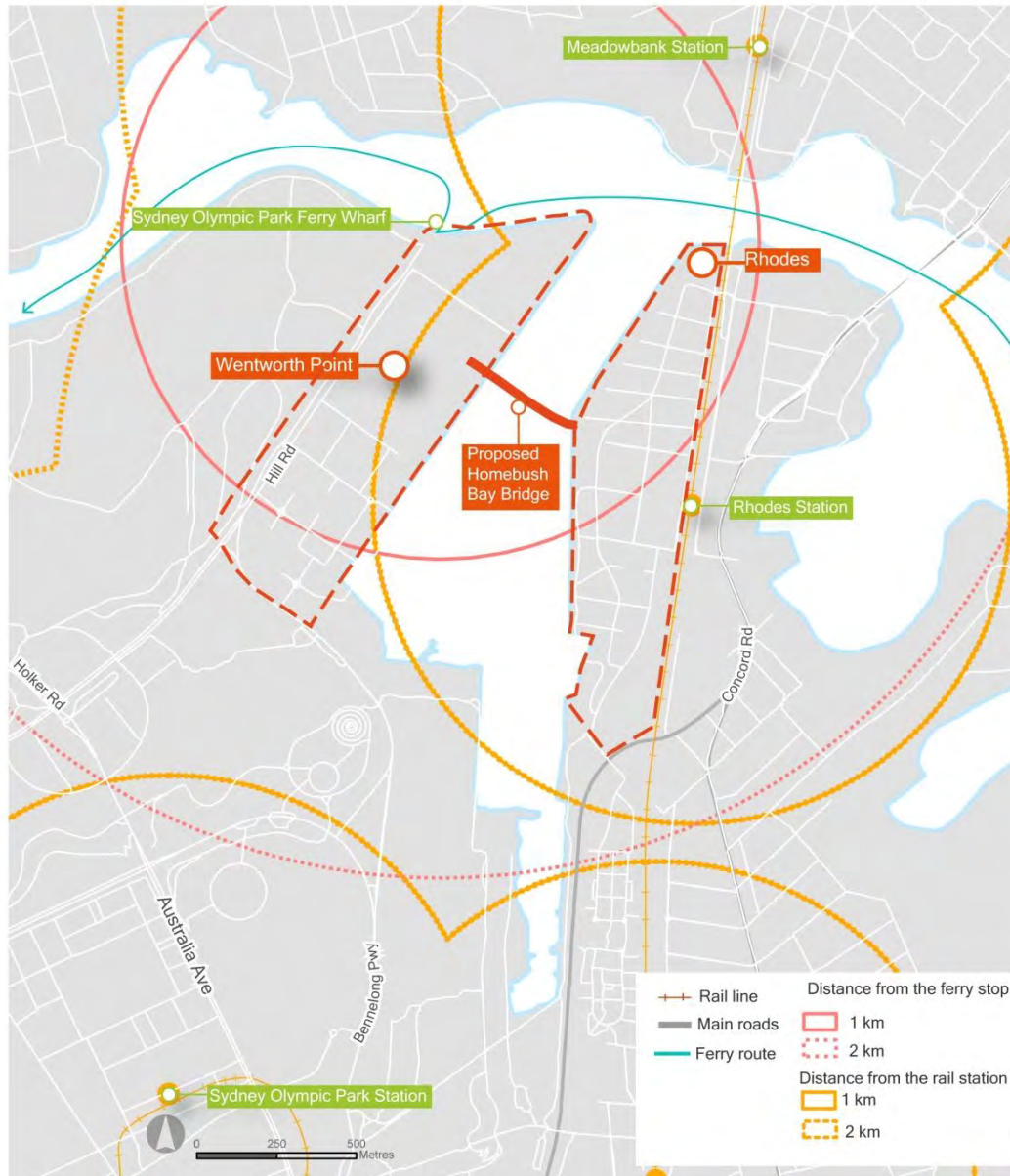


Figure 18: Existing rail and ferry links.

4.3.5 Bus services

The existing bus services in the Homebush Bay area are outlined in Table 11. The bus service directly serving Wentworth Point along Hill Road provides access to the Olympic Park Ferry Wharf, Sydney Olympic Park Station and Burwood Station.

The 533 bus runs through Rhodes Station, providing a connection from Rhodes to Ryde and Burwood. Bus networks in the broader area connect Olympic Park Station with Lidcombe and Burwood, and Parramatta.

Table 11: Bus Frequency for weekday bus services.

Route Number	Frequency in peak times	Frequency in off peak times
401 - Lidcombe to Olympic Park	Approx every 20 mins	Approx every 40 mins
525- Burwood, Strathfield, Parramatta	Approx every 10 mins	Approx every 30 mins
526 - Burwood, Strathfield, Parramatta	Approx every 30 mins	Approx every 30 mins
533- Olympic Park to Chatswood	Approx every 15 mins	n/a
458/459 – Ryde, Macquarie Uni to Burwood	Approx every 30 mins	Approx every 30 mins

Access to these bus networks from Wentworth Point and Rhodes is currently disconnected, however the proposed bridge and associated potential bus service has the opportunity to provide connections to these routes.

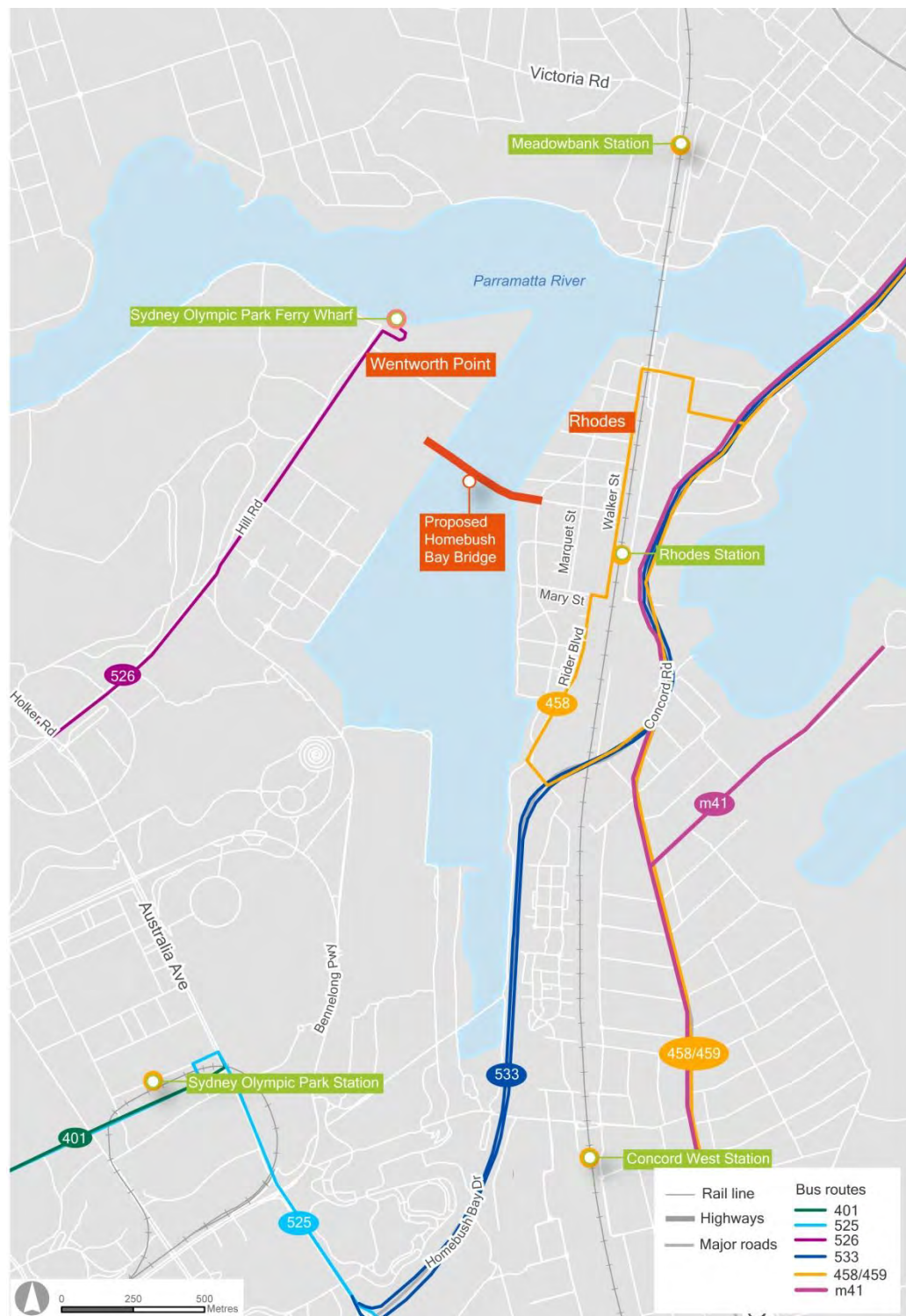


Figure 19: Existing bus services.

4.3.6 Pedestrian facilities

The pedestrian network in both Wentworth Point and Rhodes is currently in transition, relating to the continuing redevelopment of the Homebush Bay area.

At the north of the site, the street pattern of Wentworth Point currently reflects the warehouse uses that are on the site, with large blocks limiting the pedestrian permeability of the site. Existing pedestrian facilities along Hill Road are limited towards the north of the site. At the south of Wentworth Point, the existing road and pedestrian network is established, relating to the residential development in the area. A foreshore path is present on the Wentworth Point side connecting Amalfi Drive and the foreshore up to Baywater Road.

The existing pedestrian network on the Rhodes side also responds to the recent residential and retail development in the area. An existing foreshore walk exists along Homebush Bay at Rhodes, currently disconnected by development currently being undertaken in proximity to Gauthorpe Street.

The existing key attractors and generators of pedestrian activity are shown in Figure 20. These include public transport nodes, retail, community facilities and commercial uses within close proximity of the Homebush Bay area.

Homebush Bay is surrounded by a series of recreational areas including Sydney Olympic Park, Bicentennial Park and Badu Mangroves. The redevelopment at Rhodes and Wentworth Point will ultimately provide pedestrian and cycling access along the foreshore of Homebush Bay.

Figure 20 highlights the following barriers to pedestrian movement:

- Nodes of activity are within a 400 – 800 m radius of Wentworth Point and Rhodes, however, Homebush Bay presents physical and perceptual barriers to access these areas.
- Existing industrial uses at Wentworth Point disconnect the foreshore walk from The Promenade to the Sydney Olympic Park Ferry Wharf.



Figure 20: Existing and future pedestrian routes and nodes.

4.3.7 Cycling

There are extensive cycling facilities surrounding the Homebush Bay area. A strong network of off-road cycle paths is present in the Sydney Olympic Park, with cycling access to the Millennium Parklands to the east of Wentworth Point and the wetlands of Homebush Bay. There are also cycle paths and associated facilities being built to respond to development in Rhodes that will provide pedestrian and cycling access along the foreshore in the future.

Wide sealed shoulders provide cycling access on surrounding local roads. Regional cycling connections in the area include:

- Parramatta Valley Cycleway.
- Cooks River Cycleway.

Figure 21 illustrates how the existing cycling facility network could benefit significantly from a connection at Homebush Bay. The bridge would extend access for the residents and users of Wentworth Point and Rhodes to a series of transport, retail and recreational uses within a 2km to 5 km easy cycling distance in predominantly flat local terrain. The proposed bridge would continue encouraging on-road cycling in the Homebush Bay area. The bridge would also provide a link to regional bike routes for regional cycling connections.



Figure 21: Cycling connections.

5 Future context

5.1 Future Wentworth Point and Rhodes context

Population and employment projections for Wentworth Point and Rhodes have been analysed below using data from the Bureau of Transport Statistics and *Draft Wentworth Point Transport Management and Accessibility Plan (TMAP)* (Cattel, Cooper, June 2011).

Wentworth Point

The *Homebush Bay West DCP (2004)* outlines the development expected for the Homebush Bay area (now referred to as Wentworth Point). Under the *Homebush Bay West DCP (2004)*, 6,996 dwellings were approved. A proposal to increase development at Wentworth Point by approximately 20% is currently being assessed. If approved, about 8,349 dwellings would be delivered under the DCP.

Population forecasts for Wentworth Point for the years 2011, 2016 and 2023 are summarised in Table 12 below. Table 12 presents the total number of dwellings under the existing Homebush Bay West DCP as well as the total number of dwellings under a future proposal the Wentworth Point development.

Table 12 Dwelling forecasts under the uplift proposal for Wentworth Point 2011 – 2023.

Development Area	Total dwellings		
	2011	2016	2023
Wentworth Point: Lots 8,9,10,18 and 21 (Homebush Bay West DCP- Permissible)	0	1,200	2,250
Wentworth Point: Lots 8,9,10,18 and 21 (Future Proposal)	0	1,500	3,600
Other Wentworth Point developments	2,238	2,968	3,568
Total (Homebush Bay West DCP- Permissible)	2,238	4,168	5,818
Total (Future Proposal)	2,238	4,468	7,168

Source: Summary of Graf International, 2011.

Rhodes

The Bureau of Transport Statistics (previously the Transport Data Centre of Transport NSW) provides data on current and future demographic, employment and travel patterns. This data for the year 2026, released in 2009 was used to analyse the short, medium and long term population that forms the potential catchment for potential use of Homebush Bay Bridge.

Estimated population projections for the Rhodes travel zone is outlined below in Table 13.

Table 13: Population Projections.

Population Projections (Source TDC, 2009)					
Travel Zone	2006	2011	2016	2021	2026
1499 (Rhodes)	990	5973	9153	9245	9291

Source: TDC, 2009.

The structure plans relating to the future development and population forecasts for Rhodes and Wentworth Point are shown in Figure 22 and Figure 23.



Figure 22: Wentworth Point Structure Plan. Source: Homebush Bay West Structural Design Framework, UDAS July 2003.



Figure 23: Rhodes West Structure Plan. Source: Rhodes West DCP, City of Canada Bay Council 2011.

5.2 Future transport services

The *Metropolitan Transport Plan* outlines Strategic Bus Corridor 39: Burwood to Macquarie. The provision of this service supports the need for Homebush Bay Bridge for the residents of Wentworth Point to have access to the future bus corridor.

At this stage, as determined through consultation with transport authorities, no other transport services changes are planned for the immediate context.

5.3 Overview

The population projections above reflect the significant development adjoining the Homebush Bay Bridge. The Homebush Bay area presents a new medium – high density area for the Sydney Metropolitan Region to meet the Sydney Metropolitan Strategy housing targets. The significant development in the Rhodes and Wentworth Point areas presents the crucial need to provide viable transport options to reduce private vehicle movements.

6 Consultation

6.1 Statutory consultation

A series of consultation workshops were conducted as part of the Environmental Assessment for the bridge. The Government agencies consulted included:

- State Transit Authority NSW.
- RMS NSW.
- Transport for NSW.
- Sydney Olympic Park Authority.

A summary of the traffic management and access matters raised during the consultation are outlined in Table 14.

Table 14: Consultation summary

Issues	Reference to where addressed in this report.
<i>General</i>	
The bridge seeks to provide a proactive approach to travel behaviour change from the development at Wentworth Point	Section 8.2 and Section 8.3
The bridge needs to be seen as a 100 year piece of infrastructure, for the first 5 – 10 years it may be an underutilised piece of infrastructure however the bridge would establish a key connection between the two developing communities.	Section 7.2
In the long term, may consider integrating the two communities with regional bus links.	Section 9.2
Consideration for event bus movements is not within the scope of the Part 3A Environmental Assessment, if required in the long term, SOPA would lodge a Part 3A modification	Section 9.3
Community Reference Group feedback regarding the bridge design concept and bus service should be considered along with the analysis of future demand	Section 7 and Section 8.
<i>Bridge Design Concept</i>	
TNSW and the RTA require a 2 lane busway and separated shared pedestrian/ cyclist way. Thus the 8m width bridge options are not supported	Section 7.3
Grade separated crossing of the intersection where the bridge lands at the Wentworth Point side is not an option to be considered.	Section 7.5
Bridge design concept and interface with landings would be designed to be pedestrian safety oriented as possible	Section 7.9
A speed limit of 50km/h is preferred given the length of the bridge and its transport function, given the higher speeds used by confident cyclists and practicality issues for bus operation	Section 7.6
Design of the bridge should convey understanding of traffic and pedestrian, cyclist interaction	Section 7.3
There is no major issues with 'high speed' cycle commuters sharing bus lanes with buses	Section 7.2
<i>Bus service</i>	

Frequency of the bus service was discussed: high and low frequency bus movements are considered as a safety concern with potential for pedestrian/cyclist/bus collisions; lower frequency bus movements could result in pedestrians and cyclists being less aware of potential for pedestrian/cyclists/bus collisions.	Section 7.4
<i>Council</i>	
Assessment of the impact of the additional bus traffic on the roads in the Rhodes area is requested, with an indication of what ameliorative measures can and would be undertaken by the developer or other Government Authorities (ie STA, RTA) to ensure access for buses is adequate	Section 9.3
Review of proposed transport mode splits from Preliminary Environmental Assessment of the Homebush Bay Bridge.	Section 8.1

6.2 Community and stakeholder consultation

In addition to this, a series of stakeholder meetings were undertaken with the Homebush Bay Bridge Community Reference Group (CRG). Issues relevant to traffic management and access raised by the CRG are outlined in Table 15.

Table 15: CRG issues relevant to transport

Key Issues	Response in this report
Accommodation of disabled access in relation to the landing point at Wentworth Point.	Section 7.3
Traffic issues on local roads and traffic routing effects in Rhodes, include volume and size of buses.	Section 9
Concern over potential access by private vehicles in the future and the bridge becoming a rat run. Need safeguards in place to ensure private vehicle traffic can never access the bridge.	Section 7.7

7 Proposed Homebush Bay Bridge concept design

This section outlines the traffic management and access elements that forms part of the proposed Homebush Bay Bridge design.

7.1 Bridge objectives and uses

The objectives of building a new bridge cover a wide range of technical, environmental, social, and aesthetic issues. The detailed transport objectives and user group objectives are listed in Section 1.2.

In broad terms, the Homebush Bay Bridge is intended to sustainably improve local accessibility for people and thereby add to the wellbeing of the community.

The local access networks in Rhodes and Wentworth Point are currently segregated by the Bay. The Homebush Bay Bridge link would make a fundamental improvement to this connectivity, very significantly reducing existing trip times and distances between these suburbs, and allowing a whole range of new trips and new opportunities to be possible such as bus, walks and cycling to shops and cinemas etc, connection to heavy rail services and ferries, and recreation. The Homebush Bay Bridge is a classic “missing link” in an access network.

7.1.1 Carriageway end user

For bridge design purposes, the assumed standard design vehicles intended to use the Homebush Bay Bridge are as follows:

- Long standard rigid bus 12.5m long (which is representative of a typical large STA bus or three axle truck, equivalent Austroad class B6 vehicle).
- Large garbage vehicle 10.5m long, equivalent Austroad class B4 vehicle).
- Australian Standard bicycle and wheelchair.

7.1.2 Carriageway configuration and width

A series of road configurations were considered through the development of the bridge design development. Via workshops and consultation meetings, key stakeholders and agencies provided input into the development of the road configuration and width design for the bridge.

Key considerations for the design of the bridge include;

- Relevant guidelines;
- Safety;
- Estimated capacity;
- Likely user groups;
- Bridge landing point context;
- Aesthetics; and

- Costs across the whole life cycle of the Homebush Bay Bridge.

Following an analysis of these considerations, design project team workshops and stakeholder consultation workshops, Option 2c was determined as the preferred option for the following reasons:

- It allows for two way bus carriageways;
- It allows flexibility for cyclists. Cyclists wanting to travel at speed can use the carriageway while cyclists with children can use the pedestrian pathway;
- It allows pedestrian access along the separated pedestrian pathway; and
- It provides a more desirable outcome for connections at each landing point.

Option 2c presents an 11.4 m wide bridge with two lane bus shared with bicycles and a separated pedestrian pathway.

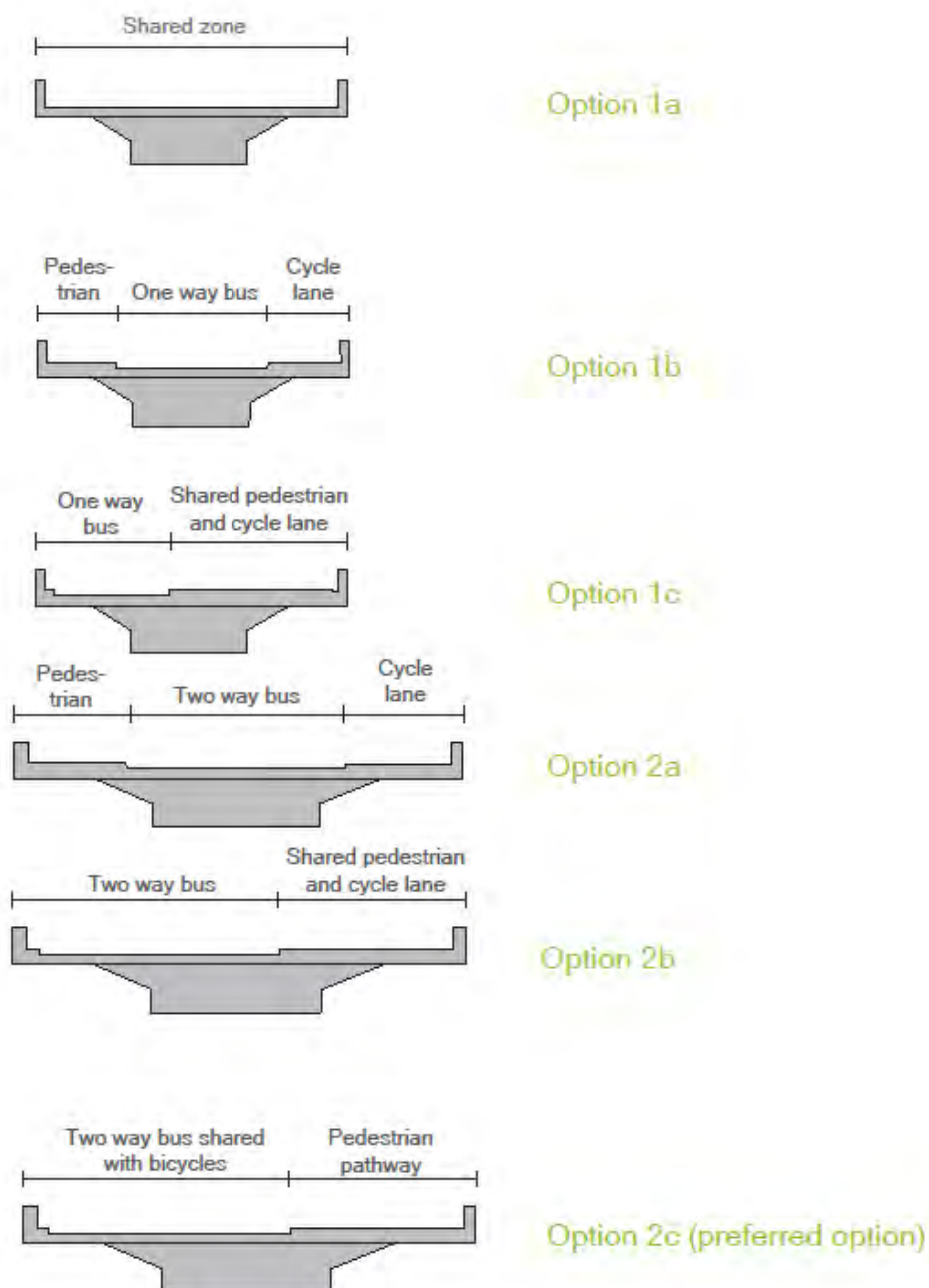


Figure 24: Bridge design concept options

The lane configuration along the bridge differs in the following situation Figure 25;

- 1: Main Bridge; and
- 2: Approach Bridge

The total width of the bridge would remain consistent (11400 mm) with differing widths for the pedestrian walkway and bus lane shared with bicycles to accommodate the turning paths for a bus at the curved approach bridge.

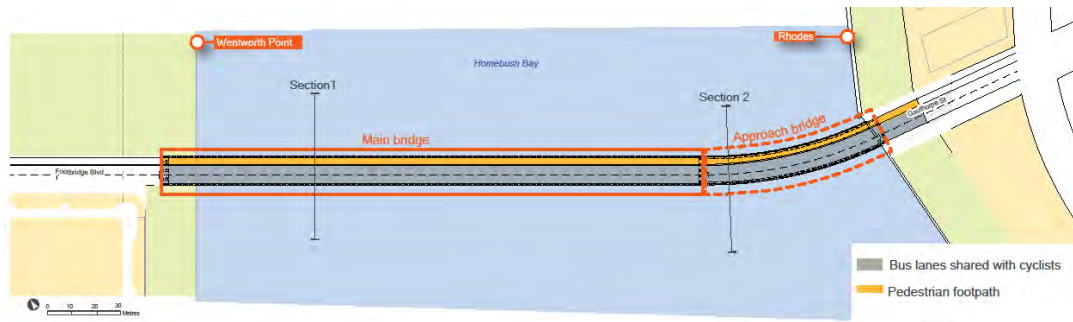


Figure 25: Bridge concept situations.

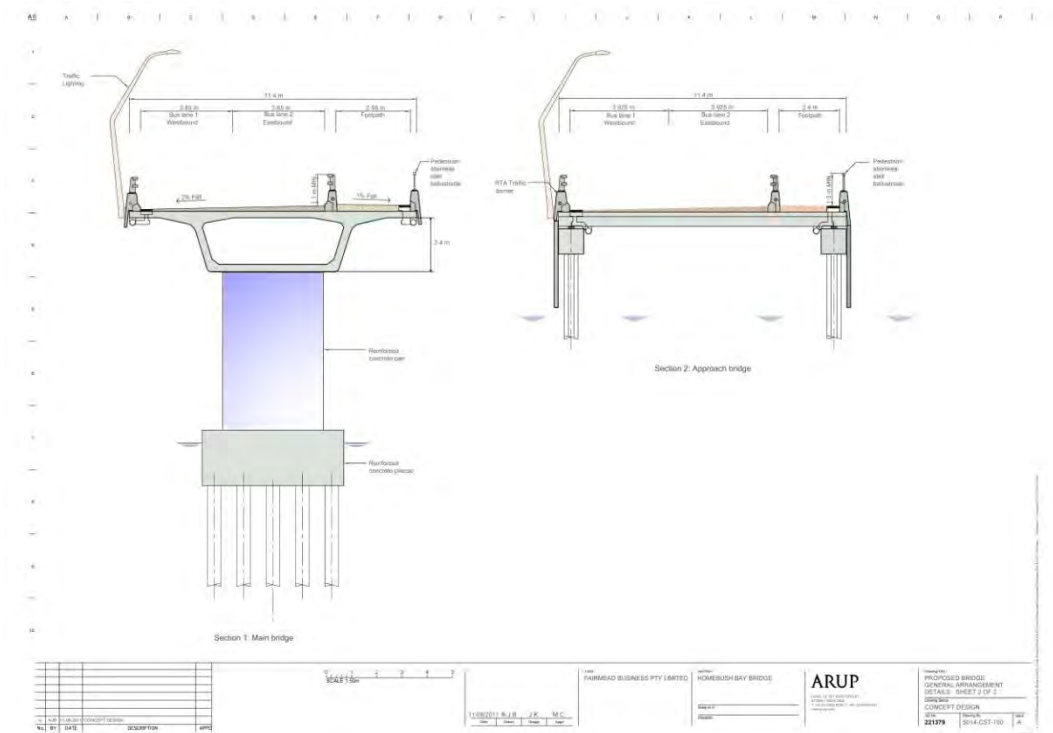


Figure 26: Bridge concept sections.

7.2 Standards and requirements

Table 16 presents the standards and requirements related to the design of the bridge from a traffic management and access perspective. Road widths were guided by the Australian Standards (AS 1428.1-2009) and Austroads Part 6A, NSW RTA standards and consultation with relevant agencies and stakeholders.

Table 16: Lane configuration requirements and standards.

Item	Element	Value	Source/ Reference	Comments
Total width of the bridge		11400 mm		
Design speed		50 km/h	Consultation with relevant stakeholders.	
Lane width	Bus lane shared with bicycles at Main Bridge	3650 mm	Design team with guidance from consultation with relevant authorities and Australian Standards, Austroads (2009) and RTA NSW Road Design Guidelines	<i>See Figure 26 for detail</i>
	Bus lane shared with bicycles at Approach Bridge	3925 mm		<i>See Figure 26</i>
	Lateral clearances	-		<i>Lateral clearances between bus lane and bridge edges and barriers have been included in the total bus lane widths</i>
Crossfall	Bus lanes	2% fall	-	-
	Pedestrian pathway	1% fall	-	-
Pedestrian pathway	Width at Main Bridge (general)	2950mm	Design team with guidance from AS 5100.1 and Austroads (2009)	-
	Width in localised areas where seating is present	2100mm		-
	Width at Approach Bridge.	2400mm		-
	Height clearance (minimum)	2400mm	AS 1428.1 and AS 1428.4, NSW RTA Bicycle Guidelines	<i>Minimum height clearances are based on bicycle rider design clearances to cater for cyclists with children under the age of 12.</i>
RTA barriers	Height (minimum)	1300mm	AS 5100.1 RTA NSW Road Design Guidelines	<i>Following discussion with authorities a barrier between the bus lanes and pedestrian pathway was highlighted as needed for safety and perceived pedestrian safety, especially for safety for children walking to the potential school</i>

				<i>at Wentworth Point. More details provided in 7.2.1.</i>
Pedestrian balustrade	Height (minimum)	1300mm	AS 5100.1	

7.2.1 Barriers and fencing

Fencing on the edge of the bridge

Adjacent to the pedestrian pathway, AS 5100.4 guides the requirement for fencing to be installed on the edge of the bridge at a recommended height of minimum 1.3m.

Separation between bus lanes and pedestrian pathway

Following discussion with authorities, a barrier between the bus lane shared with cyclists and pedestrian pathway was highlighted as recommended to address safety and perceived pedestrian safety issues. The bridge concept design provides a continuous RTA approved recast safety kerb between the bus lanes and pedestrian pathway. A separation between bus lanes and the pedestrian pathway was deemed especially pertinent to ensure the safety of children walking to the potential school at Wentworth Point.

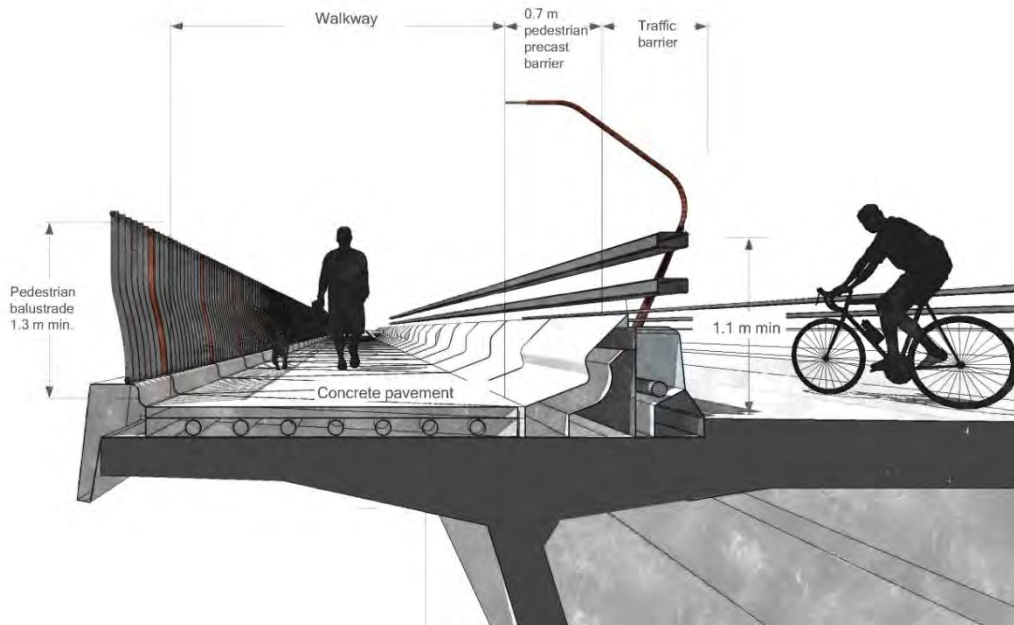


Figure 27: Cross section of the concept design of the bridge. Source: Scott Carver

7.2.2 Overhead height clearance

Of relevance to the bridge design concept are height envelope requirements. AS 1428.1 and 1428.4 suggests a minimum height clearance of 2.0m above pedestrian

walkways (shown in Figure 28) and a minimum overhead height clearance of 2.5m for bicycle operating space.

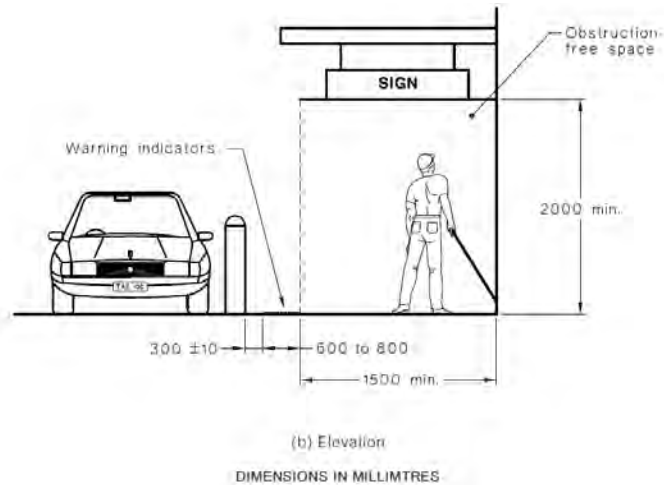


Figure 28: Footpath Height Envelope Requirement. Source: AS 1428.1 and AS 1428.4.

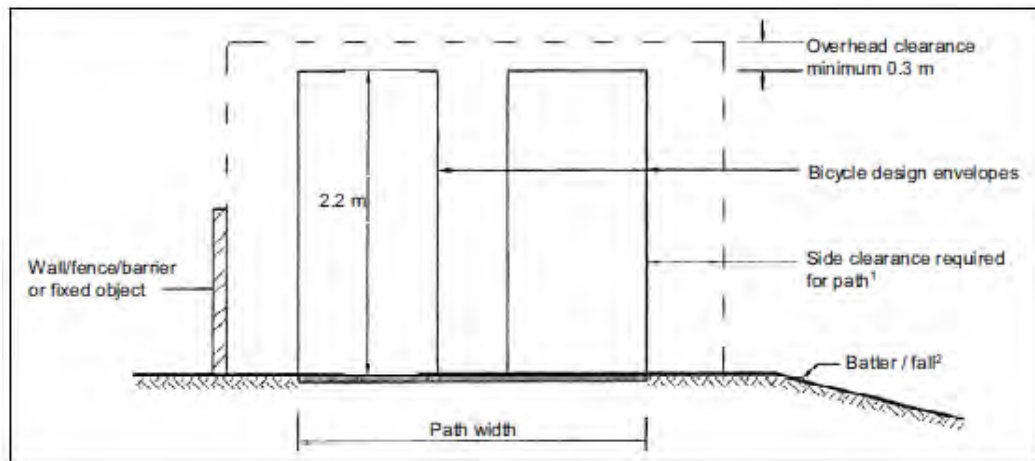


Figure 29: Bicycle operating space. Source: Austroads (2009).

7.2.3 Ramps and access requirements

AS1428.1 lists requirements for the design of sloped footpaths, shown in Table 17.

Table 17: Design Requirements for Sloped Walkways

	Gradient (constant along whole length)	Landing	Landing length	Crossfall/ Camber
Walkway	Gentle > 1 in 33	Not required		≥1:40
	1 in 33	At least every 25m ⁽¹⁾	1.2m with no change in travel direction 1.5m with change in travel direction	≥1:30 max for bitumen
	1 in 20 max	At least every 15m ⁽¹⁾		Not tolerated / required
	Between 1:33 and 1:20	Linear interpolation from above		

- (1) Maximum length can be increased by 30% if at least one side of a walkway is bounded by (a) a kerb or kerb rail and a handrail as specified in AS 1428.1, or (b) a wall and a handrail as specified in AS 1428.1.

The crossfall of footpaths should be as flat as practicable, consistent with achieving an adequately drained surface. Steeper crossfall may be provided if drainage problems are expected, but should not generally exceed 1:40.

7.3 Safety

Safety has been considered from the perspectives of actual and perceived safety. The bridge has been designed to read as a normal street, with the language of the street clearly defining the bus area and pedestrian area.

7.4 Pedestrian crossings

Pedestrian crossings are identified in the concept designs for the bridge, proposed at the landings at each end of the bridge as shown in Figure 30 and Figure 31. It is expected that further details of the locations and warrants required for the pedestrian crossings are to be investigated at later stages.

7.5 Speed

A spectrum of speed options from a 10km/h shared space to typical residential blanket speeds of 50km/h were considered and discussed with the relevant authorities. 10km/h was considered too slow for effective bus operations, 25km/h is a non-standard speed not supported by the RTA, and 50km/h was considered fast for safe operation next to a pedestrian path. A vehicular speed limit of 50km/h was agreed as the preferred speed limit for the bridge.

Average vehicle speeds would be reduced at each end of the bridge with the installation of pedestrian crossings.

7.6 Controlling bus only access to Homebush Bay Bridge

Traffic management measures to control bus-only access to the bridge would include signs and CCTV video surveillance. The design of the approaches to the bridge at both Wentworth Point and Rhodes would integrate pedestrian and bicycle priority and limit private vehicles entering the bridge. No traffic signals are proposed at this stage.

7.7 Approaches to the bridge

The following considerations provided input into the concept design for the bridge and landing points at Rhodes and Wentworth Point:

- Safety in design;
- The need to cater for pedestrian patronage;
- The need to cater for cycling patronage;
- Likely bus movements and frequency;
- Connections to key attractor and generator nodes:

- Foreshore Reserve
- Residential development in Rhodes
- Rhodes Station: Rail, bus, taxi
- Rhodes shopping centre and mixed uses – commercial, cafes
- Bus only access to the bridge;
- Cars to give way to buses at Shoreline Drive/ Gauthorpe Street; and
- Bus lane to read as a street.

7.7.1 Wentworth Point

The concept design for the landing of the bridge at Wentworth Point follows the access principles identified in Figure 30. The approach to the bridge from Wentworth Point has the following transport characteristics:

- Signage would allow for bus only access to the bridge for vehicles travelling west to Rhodes.
- A roundabout would be utilised manage bus and cycling only access to and from the bridge.
- The grade separated landing of the bridge at Wentworth Point allows buses and cyclists to merge directly into the street network without potential conflict with pedestrians and cyclists travelling along the foreshore path.
- Intersections beyond the bridge at Wentworth Point are envisaged to appear and function as a regular section of the road network, with standard traffic and pedestrian controls.
- There would be continuous pedestrian and cycling access along the foreshore, with pedestrians and cyclists able to travel under the bridge along the foreshore.
- Cycling access to the bridge would follow on- street cycling paths to continue to the bus lanes on the bridge.
- Pedestrians would access the bridge from the north, with connections from pedestrian footpaths adjacent to and through the proposed park and from the foreshore arrival square (Figure 30).



Figure 30: Access principles diagram at Wentworth Point. Source: Scott Carver, 2011.

7.7.2 Rhodes

The concept design for the landing of the bridge at Rhodes would be conducted as a joint exercise with the City of Canada Bay to complement the proposed uses on the Rhodes site. The approach to the bridge from Rhodes has the following transport characteristics:

- Appropriate signage would be used to convey bus and cyclist only access on Gauthorpe Road west of Shoreline Drive.
- A raised crossing treatment at the Rhodes landing point is proposed to manage movements from the bridge and north – south movements along the foreshore.
- The pedestrian pathway along the foreshore at Rhodes land would meet the raised crossing treatment.
- The dedicated cycling path adjacent to the foreshore at Rhodes would connect to the raised crossing treatment, using signage to indicate the shared pedestrian and cycling environment.
- Cycling access to the bridge would follow on-street cycling paths to continue to the bus lanes on the bridge.



Figure 31 Access principles diagram at Rhodes. Source: Scott Carver, 2011.

8 Impact on connectivity

This section highlights the potential impact of the Homebush Bay Bridge in facilitating efficient movement of pedestrians, cyclists and public transport (buses).

The proposed bridge would provide a public transport (bus), pedestrian and cyclist crossing over Homebush Bay in the form of a two lane bus lane and a separated pedestrian pathway. This would greatly improve immediate and regional connectivity for both Wentworth Point and Rhodes as residents currently have to travel an indirect route around the foreshore to access each side of Homebush Bay. The connectivity provided by the proposed bridge allows direct connections to access Millennium Parklands, retail, cafes and restaurants and commercial uses on both the Rhodes side and Wentworth Point side as shown in Figure 32.

Key movements facilitated by the Homebush Bay Bridge are shown in Table 18. These key movements provide significant opportunity to increase the share of the proportion of total journeys to work public transport in the Sydney Metropolitan Region and increase the mode share of active transport trips.

Table 18: Key movements facilitated by the Homebush Bay Bridge by bus, walking or cycling.

Direction	Movement
Eastbound	Wentworth Point to Rhodes train station
	Wentworth Point to Rhodes bus services
	Wentworth Point to Rhodes retail and commercial facilities
Westbound	Rhodes to Sydney Olympic Park ferry
	Rhodes to Wentworth Point proposed maritime facilities
	Rhodes to Millennium Parklands
	Rhodes to Sydney Olympic Park centre and station

Use of the pedestrian and cyclist facilities along the foreshore of Homebush Bay would be enhanced by the more direct connection to the Millennium Parklands provided by the Homebush Bay Bridge. The Homebush Bay Bridge provides the potential for a future bus service to utilise the bridge and provide connections to key nodes in Wentworth Point and Rhodes. This will augment existing public transport services that include other bus services, train services from Sydney Olympic Park and Rhodes, and ferry services from Sydney Olympic Park.

The Homebush Bay Bridge is expected to influence the transport behaviour in the Homebush Bay area. Details of the projected mode shifts are shown in Section 8.1.1 and Section 8.1.2.



Figure 32: Connectivity map.

9 Impact on travel journey to work

This section summarises the estimated changes in travel journey behaviour as a result of the proposed bridge. The analysis is based on *Wentworth Point Transport Management Accessibility Plan* (Cattell Cooper, December 2011) found in Appendix C.

9.1.1 Projected future mode split: Wentworth Point

The *Wentworth Point Transport Management Accessibility Plan* (Cattell Cooper, December 2011) provides a target journey to work transport mode split for Wentworth Point residents. Cattell Cooper, 2011 analysis supports a target mode share of 65% car travel as driver, 33% public transport and 2% other modes. Of the public transport trips, 86% are assumed to be made by rail and 14% by bus as shown in Table 19.

Table 19: Target journey to work public transport distribution for Wentworth Point post - 2023.

Mode	%Trips
Train Trips	86%
Train trips via Rhodes	82%
Train trips via Rhodes northbound	10%
Train trips via Rhods southbound	72%
Train trips via Sydney Olympic Park	5%
Bus Trips	14%
Bus trips east	6%
Bus trips west	8%

Source: Cattell Cooper 2011.

The *Wentworth Point TMAP* identifies that a bridge would be necessary to ensure travel to and from Wentworth Point is sustainable. The analysis highlights that the bridge facilitates public transport (bus and train) travel sufficiently, resulting in a 35% mode split towards modes other than private vehicles, which contributes towards the achievement of the NSW State Plan target of increasing public transport use to Parramatta, Sydney CBD and across the Sydney Metropolitan Area.

9.1.2 Projected future mode split: Rhodes

It is assumed that the future mode split for the Rhodes travel zone area would remain largely the same as the existing journey to work mode split for the area (as shown in Section 4.2.1) with an estimated increase of journey to work by ferry (shifting car based trips to ferry by 2%). The projected future modes split for Rhodes for the year 2021 is shown in Table 20.

Table 20: Mode split for Rhodes travel zone

Mode	Mode split
Car driver/passenger	56%

Train	32%
Bus	0%
Ferry	2%
Other (bicycle and walking)	10%
Totals	100%

9.1.3 Contributing to the NSW Government targets for public transport use

Access to Rhodes Station, Olympic Park Ferry Wharf, and bus routes and taxi operations at Rhodes provided by the proposed bridge allow for greater travel by public transport to and beyond the Homebush Bay area.

As highlighted by the *Wentworth Point TMAP (2011)*, it is considered that the local transport network is reasonably satisfactory for an area in this part of Sydney. Discussion of the public transport and service requirements to cater for the projected transport behaviour of Wentworth Point and Rhodes and meeting NSW Government targets is shown below.

Rail

The *Wentworth Point TMAP (2011)* provides an analysis of the rail services and ability to meet the rail service needs of the area as it suggests;

“The increase in demand for rail travel at Rhodes arising from the proposed development at Wentworth Point is likely to be very gradual, commencing with the construction of the Homebush Bay Bridge, and peaking only when the full level of development is achieved after 2023. It is suggested that the most likely impact is on the capacity of the actual trains and train paths operating the service on the Northern Line, rather than on the access and interchange infrastructure. Rhodes station has been designed to accommodate growth, and the facilities have been assessed by the TMAP as adequate to cater for projected increases in bus movements and interchange...It is understood that several operational and infrastructure options are currently being considered by the NSW Government through the Department of Transport and RailCorp to ensure that adequate capacity exists for the long-term strategic needs of the rail network.”

Bus

The Homebush Bay Bridge provides a link available for existing and future bus routes to utilise to increase the provision of public transport services in the area. The provision of a bridge link across Homebush Bay presents possible scope for increased bus services in the area.

The *Wentworth Point TMAP (2011)* suggests that minor alterations to existing local bus routes to use the proposed Homebush Bay Bridge could cater for the public transport demand of the residents at Wentworth Point. Initial bus route alterations that have been considered by the *Wentworth Point TMAP (2011)* include:

- Diverting bus route 533 to travel through Wentworth Point and running additional peak services in both directions.

- Extending Route 526 to Rhodes station.

These bus routes and services are further discussed in Section 9.

Responsibility for planning and funding bus services rests with Transport for NSW, and this department should have in place monitoring and needs assessment processes to determine when and how bus services should be introduced.

10 Potential bus services

The provision of a bus service is seen as integral to the development of Wentworth Point, to improve the connectivity of the Homebush Bay area, and encourage the use of public transport by residents and visitors.

The Homebush Bay Bridge provides a link available for existing and future bus routes to utilise to increase the provision of public transport services in the area. The provision of a bridge link across Homebush Bay presents possible scope for bus services to be routed through the area via the Homebush Bay Bridge.

A discussion of the existing and future bus services that could potentially use the bridge and relevant details is shown below.

10.1 Potential bus links

The likely bus links are shown in Figure 33 and Figure 34. Figure 33 presents the possible scope for bus links enabled by the Homebush Bay Bridge.

The *Wentworth Point TMAP 2011* recommends minor alterations to existing local bus routes to travel along the proposed Homebush Bay Bridge as shown in Figure 34. The recommended initial bus route alterations are:

- Enhancing bus route 533 with additional peak services in both directions; and
- Extending bus route 526 to Rhodes station.

Transport authorities were consulted for this Environmental Assessment to identify future bus services. No specific details on possible bus services over the Homebush Bridge or changes to existing routes around the area were provided at this stage. Bus routes are regularly reviewed through Transport for NSW and as the Homebush Bay area develops it is expected that Transport for NSW would review the bus routes in the area as part of their operations and consider the link provided by the Homebush Bay Bridge in the development of future bus routes.



Figure 33: Preliminary bus route investigation.



Figure 34: Potential Bus links. Source: Scott Carver 2010.

10.1.1 Potential extension of Route 526

The *Wentworth Point TMAP, 2011* (Appendix C) recommends the extension of bus route 526. This is shown in Figure 34.

The extended 526 could operate to/from the (Wentworth Point) development and Rhodes station via Gauthorpe and Walker streets (pick up and set down southbound in Walker Street at Rhodes Station) with the service turning via Mary

and Marquet Streets. The use of Marquet Street would offer easier bus manoeuvrability and avoid any grade issues.

Extension of the bus route 526 would follow existing STA routes where possible. Two possible bus routes were considered for the extension of bus route 526 (Figure 34):

Route A:	Route B:
1. From Hill Road after looping at the Sydney Olympic Park Ferry Wharf, left on Footbridge Boulevard, 2. Continue along the Homebush Bay Bridge and continue along Gauthorpe St 3. Right onto Walker Street 4. Right onto Mary Street 5. Right onto Marquet St 6. Left onto Gauthorpe and continue along to Homebush Bay Bridge 7. Continue along Footbridge Boulevard 8. Left onto Hill Road. 9. Continue along existing route	1. From Hill Road after looping at the Sydney Olympic Park Ferry Wharf, left on Footbridge Boulevard, 2. Continue along the Homebush Bay Bridge and continue along Gauthorpe St 3. Right onto Marquet St 4. Left onto Mary St 5. Left onto Walker St 6. Left onto Gauthorpe and continue along to Homebush Bay Bridge 7. Continue along Footbridge Boulevard 8. Left onto Hill Road. 9. Continue along existing route

Route A includes a right turn from Gauthorpe St onto Walker St. It is recognised that with future developments around the Rhodes areas, this turning movement could experience delays, therefore Route B is presented as an alternate option.

Route A.



Route B.



Figure 35 Possible bus route extension to route 526.

10.2 Impact on local roads

10.2.1 Bus volumes

As shown Table 21, the *Wentworth Point TMAP (2011)* suggests a bus frequency of a base of 8 – 10 buses per hour in the early years, peaking at approximately 20 buses per hour at full development (which comprises approximately 10 buses in each direction on the bridge). It is suggested that this estimated bus frequency will accommodate the growth in bus demand and discourage car use without increasing traffic volumes in the road network. The frequency is presented for the busiest time of the day (i.e. AM peak hour periods) for both directions

Table 21: Estimated bus frequency on the Homebush Bay Bridge.

Timing	Type of vehicle	Estimated Peak Frequency (AM Peak period in both directions)
Earliest year of opening (2016)	Standard size bus	8-10 buses per hour
2023	Standard size bus	Approximately 20 buses per hour

Source: Wentworth Point TMAP, Cattell Cooper 2011.

Note: Future bus service provision would be based on demand.

Extension of the bus route 526 would follow existing STA routes where possible to minimise impacts on local roads, intersections and to cater for bus turning movements.

10.2.2 Bus turning movements

Figure 35 shows a possible extension to the 526 bus route. Two variations are shown at the Rhodes Station end of the route – a clockwise loop and an anti-clockwise loop.

On the western side of Homebush Bay, the 526 bus route currently uses Hill Road to Sydney Olympic Park Ferry Wharf. The proposed Hill Road / Footbridge Boulevard intersection would be able to accommodate both left and right turning buses. Footbridge Boulevard, between Hill Road and the bridge, will be a major east-west road with sufficient width to accommodate bus movements.

On the eastern side of Homebush Bay, the bus route would use Gauthorpe Street between the bridge and Walker Street. Gauthorpe Street, Walker Street, Mary Street and Marquet Street are typical 12.8m wide roads that have sufficient width to accommodate bus movements.

For the clockwise loop, the bus route would make a number of right turns and would enable use of the existing bus stop on the railway side of Walker Street adjacent to Rhodes Station. All intersections have sufficient width to accommodate right turn manoeuvres. The left turn from Marquet Street to Gauthorpe Street could also be accommodated. Buses turning right from Gauthorpe Street to Walker Street would not have priority and may be subject to delays at peak periods as traffic volumes in the area increase.

For the anti-clockwise loop, the bus route would make a number of left turns. Buses would use the existing bus stop on the western side of Walker Street adjacent to Rhodes Station. All intersections have sufficient width to

accommodate the right and left turn manoeuvres. Buses are unlikely to experience significant delays on the right turn from Gauthorpe Street to Marquet Street.

10.2.3 Impacts on the bus/rail interchange area

Rhodes station currently has bus stop facilities on both sides of Walker Street.

As noted in the *Wentworth Point TMAP (2011)*, the existing 44m of kerb space available on the western side of Walker Street is considered sufficient to accommodate two simultaneous bus arrivals, plus some level of kiss and ride activity. Therefore the kerb space available on the western side of Walker Street is considered to be suitable for the additional buses that could be generated by an extension of the 526 bus route.

The *Wentworth Point TMAP* analysis concludes that the additional demand generated by the (Wentworth Point) proposal will be well within the capacity of the enhanced Rhodes station to accommodate.

10.3 Cross regional bus links

Sydney's Metrobus network has recently been expanded from five routes to 13 routes, providing high-frequency, high-capacity links between key employment and growth centres across Sydney. These eight extra Metrobus routes would be on the streets by mid-2011, providing 400,000 additional bus passenger spaces a week. The M41 (connecting Macquarie Park, Ryde, Burwood, Campsie, and Hurstville) passes through Rhodes and the M92 (connecting Parramatta, Lidcombe, Bankstown and Sutherland) passes through Lidcombe. Cross regional bus routes also operate for special events at Sydney Olympic Park.

The bridge has the opportunity for cross regional bus routes to utilise the bridge if suited to the route network design, however, it is not anticipated that the cross regional bus routes would utilise the bridge at early development.

As noted above, responsibility for planning and funding bus services rests with Transport for NSW. Bus routes are regularly reviewed as part of Transport for NSW functions and as increased development occurs at Rhodes and Wentworth Point along with the development of the Homebush Bay Bridge, it is expected that the bus networks in this area would be reviewed under this process.

10.4 Special events at Sydney Olympic Park

This assessment does not include the bridge to be used for events. SOPA has advised that special event buses would not use the proposed bridge in the short term. At further stages, SOPA may conduct investigations for Sydney Olympic Park event buses to use the bridge in the longer term if required.

11 Construction Traffic

11.1 Description of proposed construction works

There would be two construction sites: Wentworth Point and Rhodes. The Wentworth Point site would be the primary construction site for the main bridge structure. The activities on the Rhodes construction site would be used for the construction of the approach bridge and to provide access to install bridge finishes.

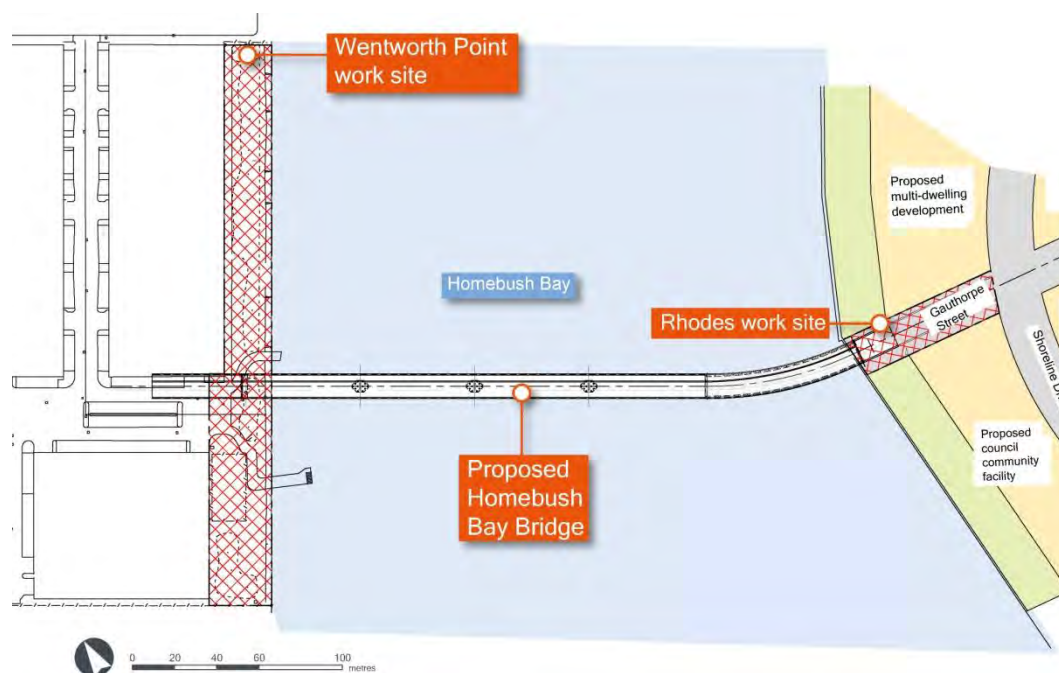


Figure 36: Construction site locations.

The bridge construction would take approximately 24 months with the majority of the construction tasks for the main bridge structure executed from the Wentworth Point work site. An indicative program of the bridge construction is presented below.

Table 22: Estimated Construction Timeframe

Stage	Timeframe
Earth Works and Pier/Foundation Construction	10 months
Bridge Construction	12 months
Finishing Works	2 months

11.2 Traffic impacts of proposed construction works

11.2.1 Existing site traffic

The surrounding arterial roads and intersections into Sydney Olympic Park are currently susceptible to congestion and delays during peak periods. Other

developments on both sides of Homebush Bay are currently under construction in the area.

Traffic counts from 2010 (*Wentworth Point Precinct Maritime Concept Plan, Homebush Bay*) show that traffic on Hill Road passing the Wentworth Point site in the AM and PM peak is approximately 600 vehicles per hour. Approximately half of these vehicles were heavy vehicles accessing industrial areas north of the residential area.

11.2.2 Construction traffic

Construction materials and plant would be delivered by truck.

Construction of the Homebush Bay Bridge would generate vehicle trips primarily on the Wentworth Point side for construction of the Main Bridge. The Rhodes construction site would be used for construction of the approach road from Shoreline Drive and to provide access onto the bridge for delivery and installation of bridge finishes and may also be used for construction of the Access Bridge. As such, the Rhodes compound site would generate a smaller amount of traffic.

The main access roads for Wentworth Point would be via Hill Road and the M4 Motorway for traffic from the west. For traffic from the west, access would be via Silverwater Road and Holker Street, then Hill Road. The Rhodes site would generate only minimal construction traffic and it is not likely to cause any greater impact than the construction sites that currently exist in this area. Access to Rhodes for construction traffic from the north would be via Concord Road, Averill Road, Cavell Avenue, Leeds Street, Walker Street then Gauthorpe Road. For construction traffic from the south, access to Rhodes would be via Homebush Bay Drive, Rider Boulevard, Mary Street, Walker Street then Gauthorpe Street.

Vehicles accessing the construction sites during construction would mainly comprise private vehicles for workers. Heavy vehicles including Articulated Vehicles (AV) such as precast girder delivery trucks and Heavy Rigid (HR) such as concrete trucks are also expected to access the site.

A concrete batching plant may also be temporarily installed during construction on the Wentworth Point site. Regular deliveries of raw concrete materials would still be expected under this scenario.

Table 23 outlines the approximate traffic volumes relevant to the construction stage of the bridge for both sites combined. These have been separated by the likely construction stages. Other heavy machinery would have to be delivered to the construction site in the preliminary stage. Heavy materials or equipment such as girders or machinery are likely to be shipped in outside of peak traffic hours.

Table 23: Approximate traffic volumes

Stage	Vehicle type	Estimated number of round Trips to site
Earth Works / Foundations	Excavators (carried by trucks)	4 in total
	AV, HR equipment deliveries	5-10 per week
	HR concrete agitators (pier)	10-20 per week
	Vans/Cars	25-50 per day
Bridge Construction (Precast girders):	AV steel delivery trucks	1-3 per week
	AV girder delivery trucks	10-12 per day
	HR concrete agitators	5-6 per day
	HR concrete pumps	1-2 per day
	Vans/Cars	25-50 per day
Bridge Deck Construction (In-situ concrete pour)	AV steel delivery trucks	4-6 per week
	HR concrete agitators	25-50 per week
	HR concrete pumps	1-2 per day
	Vans/Cars	25-50 per day
Finishing Works	HR equipment deliveries	2-6 per week
	Vans/Cars	25-50 per day

Note: Estimates are based on examples of similar recent worksites.

11.2.3 Cumulative impact of existing site and construction traffic

Wentworth Point

It is estimated that the construction traffic associated with the bridge would increase by a maximum of up to 100 round trips to the site per day during the busiest construction stage, approximately 200 trips on the road network per day. If up to 25% of the daily traffic occurred in the peak hour, this would increase the existing Hill Road traffic of 600 vehicles per hour by 50 vehicles to a total estimated vehicle traffic up to 650 vehicles per hour. Additional traffic volumes from the construction of the Homebush Bay Bridge are only a minor proportion of existing traffic; hence the road network performance is unlikely to change substantially.

Rhodes

The Rhodes site is proposed to be a secondary construction site and would attract fewer heavy vehicles than Wentworth Point because of the limited storage on-site. Less than 50 vehicles in the peak hour would be generated on the surrounding road network, hence road network performance is unlikely to change substantially.

11.2.4 Parking

It is assumed up to approximately 50 workers per day would access the Wentworth Point site in any given stage. Nominated parking areas would be erected to control the parking situation. The Wentworth Point site would provide up to 35 cars to be provided on site or on a nearby site, to be agreed in detailed design as there are few parking opportunities in the surrounding streets. This number should be kept to a minimum by encouraging workers to access the site using public transport options such as the bus and ferry for Wentworth Point or train to Rhodes or car sharing to increase vehicle occupancy. A further parking for up to 10 vehicles should also be considered on the Rhodes site to be provided within the site to minimise the impact on the surrounding streets.

11.2.5 Driver code of conduct

Drivers wishing to access the site for any reason would need to report to the site office and receive parking instructions and guidance. As there are large residential areas around the site, special route instructions may be necessary for visitors to the site.

11.3 Measures to ameliorate construction traffic impacts

To keep the construction related traffic to a minimum on the surrounding roads, a preliminary access route into the site from the main access points such as the M4 Western Motorway has been designed and presented in Figure 37. The route would be clearly marked by traffic control signage to ensure sure vehicles are following the correct route.

Larger vehicles such as the AV girder delivery articulated vehicles would need to be considered when delivering. These large vehicles would be delivering at larger intervals outside of peak periods when possible in order to avoid impacts to the surrounding residential areas and the road network with the need for possible escorts. Construction vehicles would also be restricted by the roads they can use to access the site and as such should follow the routes outlined in Figure 37.



Figure 37: Construction Vehicle Routes.

11.4 Public transport services affected

As the construction works would take place away from major trunk routes, there would be minimal impact to public transport. Bus and rail services would likely not be affected.

11.5 Construction traffic provisions made for emergency vehicles, heavy vehicles, cyclists and pedestrians

Wentworth Point

Construction works and vehicle storage would be mainly confined to the Wentworth Point site. As such, no additional specific provisions for emergency vehicles, heavy vehicles, cyclists or pedestrians have been identified on the surrounding road network.

Rhodes

The construction of the bridge would create temporary interruptions to the foreshore path at roads as shown in Figure 36.

A pedestrian and cycling route based on safe public paths would be formed around the proposed work site, via Shoreline Drive. The route would aim to maintain public access to the Rhodes promenade and the public wharf. Details of the actual route will be provided in the CEMP.

12 Conclusions

This Assessment addresses the Director General's Requirements (DGRs) for Homebush Bay Bridge (10_0192) related to transport that were issued on 21st December 2010.

This Assessment concludes that the proposed bridge is feasible from a multi-modal transport perspective, and can satisfy the Homebush Bay Bridge objectives including:

- i. 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.
- ii. Encourage the use of transport options other than private motor vehicle in the Homebush Bay area.
- iii. Deliver a bridge design that fits with and contributes to Rhodes and Wentworth Point built forms, streetscapes, public domains and Homebush Bay recreational maritime activities.
- iv. Consider input from the community and key stakeholder representatives into the development and design of the bridge.
- v. 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.

