MAJOR PROJECT ASSESSMENT
Victoria Road Upgrade

Director-General's Environmental Assessment Report
Section 75I of the *Environmental Planning and Assessment Act 1979*

April 2009

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EXECUTIVE SUMMARY

Victoria Road is one of Sydney's busiest transport corridors and services both local and regional demands for travel between North Western Sydney and the Sydney CBD. The development of a network of Strategic Bus Corridors, a NSW Government initiative drawing on the findings of the *Ministerial Review of Bus Services in NSW* (Unsworth, 2004), was developed to provide a network of bus corridors linking Sydney's major centres, railway stations and services. Victoria Road was identified as Strategic Bus Corridor 10.

In 2006, the Victoria Road Upgrade Project was announced as a new initiative as part of the Premier's *Urban Transport Statement* (NSW Government 2006). The purpose of the Victoria Road traffic improvements was identified to improve the efficiency and reliability of Victoria Road bus services and to alleviate general traffic congestion on Victoria Road.

The NSW *State Plan – A New Direction for NSW* (2006) supports a vision for NSW in which the transport system is defined by its safety and reliability. To deliver an effective transport system, the *State Plan* sets a number of priorities that relate specifically to transport. The Victoria Road Upgrade proposal is consistent with *State Plan* priorities. It represents a significant investment in transport infrastructure, it targets the reliability and efficiency of bus operations during peak periods, it includes improvements to safety aspects of the road environment, and it provides the bus priority infrastructure needed to accommodate additional services in the future.

The NSW Roads and Traffic Authority (RTA) proposes to upgrade Victoria Road between Westbourne Street, Drummoyne and The Crescent, Rozelle to improve the reliability and efficiency of bus services by providing bus priority measures. To achieve this, the RTA proposes to implement a tidal flow scheme through Drummoyne, reallocate road space in Rozelle and construct an additional bridge over Iron Cove.

The Department has assessed the Proponent's Environmental Assessment and Submissions Report (including revised Statement of Commitments) and taken into consideration issues raised in private and public submissions. The Department is satisfied that the environmental assessment has considered the key issues to the greatest extent practicable, that mitigation measures are appropriate and that the residual impacts of the proposal are manageable and acceptable.

However, this does not imply that there are not significant environmental constraints to the project. Of particular note are traffic and transport impacts during construction, social and economic impacts including loss of car parking, construction noise impacts, and the visual amenity and urban design aspects of the project. These issues were reflected within the 700 submissions received from Government agencies, Council and the local community during the exhibition of the Environmental Assessment. It is understood that further refinement of the proposal will occur during detailed design with the aim of further reducing these impacts.

The Department has recommended conditions of approval which define performance standards and targets which the project must achieve as well as monitoring requirements which are aimed at measuring the effectiveness of the mitigation measures which the Proponent has committed to in order to minimise impacts.

In summary, the Department is of the opinion that on balance the project is justified and in the public interest. It is anticipated that the Proponent's revised proposal, Statement of Commitments and the recommended conditions of approval, should ensure that the project is designed, constructed and operated to meet acceptable environmental and amenity limits.

Consequently, the Department recommends that the Minister for Planning approve the Victoria Road Upgrade, subject to the recommended conditions of approval.

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1. BACKGROUND

1.1 Strategic Context

In 2006, the Victoria Road Upgrade Project (The Project) was announced as a new initiative as part of the Premier's *Urban Transport Statement* (NSW Government 2006). The purpose of the Victoria Road traffic improvements was identified to improve the efficiency and reliability of Victoria Road bus services and to alleviate general traffic congestion on Victoria Road.

The initiative draws on the findings of the *Ministerial Review of Bus Services in NSW* (Unsworth 2004), which recommended the development of a network of strategic bus corridors linking Sydney's major centres, railway stations and services. It was recommended that strategic bus corridors be completed by bus priority measures which aim to improve bus reliability and reduce travel time. Victoria Road was identified as Strategic Bus Corridor 10. It is classified as a Strategic Bus Corridor for the following reasons:

- On a typical weekday between 7am-9am, up to 112 buses carry more than 6,400 citybound commuters between the Gladesville Bridge and The Crescent at Rozelle.
- The number of people using buses between 7am-9am has grown and represents about 45 percent of commuters.
- Traffic congestion can lead to 'bus bunching' and scheduling difficulties.

The *Urban Transport Statement* also complements the *Metropolitan Strategy* (NSW Government 2005), which sets the key transport initiatives to support the future growth of Sydney and to improve the availability and reliability of public transport services. A key objective is the acceleration of works for the Strategic Bus Corridor Network to encourage public transport patronage and to improve bus travel times and reliability.

The NSW Government, in July 2008, announced $156 million in funding for the project when the preferred project option was announced. The project is listed in the *State Infrastructure Strategy 2008-09 to 2017-18* (NSW Government 2008) as a Sydney Urban Transport project, and has been committed to in the Mini Budget Speech given by the Treasurer Eric Roozendaal on 11 November 2008 at the Legislative Assembly, Parliament of New South Wales.

The NSW *State Plan – A New Direction for NSW* (2006) supports a vision for NSW in which the transport system is defined by its safety and reliability. To deliver an effective transport system, the *State Plan* sets a number of priorities that relate specifically to transport:

- Priority E7 – Improve the efficiency of the road network.
- Priority P2 – Maintain and invest in infrastructure.
- Priority S6 – Increasing share of peak hour journeys on a safe and reliable public transport system.
- Priority S7 – Safer roads.

The Victoria Road Upgrade proposal is consistent with the *State Plan* priorities. It represents a significant investment in transport infrastructure, it targets the reliability and efficiency of bus operations during peak periods, it includes improvements to safety aspects of the road environment, and it provides the bus priority infrastructure needed to accommodate additional services in the future.

1.2 Victoria Road

The project is located on Victoria Road between Westbourne Street, Drummoyne and The Crescent, Rozelle (as shown in Figure 1).

This part of Victoria Road extends for a distance of approximately 3.5km. Victoria Road, which forms part of the Parramatta-Central Sydney transport corridor, is one of Sydney's busiest transport corridors and services both local and regional demands for travel between North Western Sydney and the Sydney CBD.

The study area is described according to three sections: Drummoyne, Iron Cove Bridge, and Rozelle.

Drummoyne

The Drummoyne section of the project is located generally from Westbourne Street to Park Avenue at the western end of Iron Cove Bridge in the Local Government Area of Canada Bay. The road is mostly about 18 metres wide, with a narrow median and six traffic lanes (three in each direction).

Along this section, there are five signalised intersections, the main one at Lyons Road. Right-turn movements are not permitted from Victoria Road in either direction at intersections, except citybound at Westbourne Street.

Figure 1 – Location of the project (RTA 2008)

The road has clearways during the PM peak period in the peak direction only. Parking is permitted on a timed basis, with daily restrictions imposed through clearways and no stopping/no parking signs. A T3 lane operates between 6am and 10am weekdays citybound. There are six bus stops in each direction including a major bus stop near Lyons Road outbound.

Land uses beside the roadway include residential (low, medium and high density), retail, industrial and public open space. The commercial area extends from about halfway between Tavistock Street and Lyons Road south to the intersection of Victoria Road and Park Avenue.

Iron Cove Bridge

The Iron Cove Bridge Section of the project extends from Park Street, Drummoyne to Terry Street, Rozelle, and includes Iron Cove Bridge.

Iron Cove Bridge is an historic steel truss structure which crosses Iron Cove, linking Drummoyne and Rozelle. Built in 1955 it is a local landmark and has a 'gateway' quality for Iron Cove and the adjacent suburbs. The Iron Cove Bridge is of state heritage significance, and is listed on the *Canada Bay LEP 2008*, the RTA s170 Register, and the *Sydney Regional Environmental Plan (Sydney Harbour Catchment) 2005*.

The bridge carries five lanes of traffic across Iron Cove, four on the existing bridge (13.4m wide), and one on an 'outrigger' lane (3.1m wide) which was added to the western side in 1961. Traffic on the bridge operates under a tidal flow scheme, with three citybound lanes in the weekday AM peak and three outbound lanes at all other times. A T3 lane operates between 6am and 10am weekdays citybound.

A shared-use (pedestrians and cyclists) path is located on the eastern side of the bridge. It forms part of the Bay Run (a seven-kilometre cyclist and pedestrian circuit) and the Parramatta Valley regional cycleway.

Iron Cove forms part of Sydney Harbour and is used extensively for recreational activities such as sailing and rowing, and incorporates the only two kilometre rowing course on Sydney Harbour. The land around Iron Cove contains road infrastructure, parklands and other leisure facilities (including the Bay Run), and residential (low, medium and high density), commercial and industrial development.

Rozelle

The Rozelle section of the project is located generally from Terry Street to The Crescent in the Local Government Area of Leichhardt. This section of Victoria Road is generally wider than the Drummoyne section.

In the citybound direction, Victoria Road accommodates dual right-turn lanes at Darling Street and Robert Street and one right-turn lane at Evan Street, Gordon Street and Terry Street, and at The Crescent (which operates as a dual right-turn outside of the AM peak). There are six signalised intersections along this section, with the main intersection at Darling Street.

The citybound kerbside lane operates as a T3 lane between 6am and 10am, and there are clearways in the PM peak in both directions. There are six bus stops citybound, including a major stop near Darling Street, and seven bus stops outbound.

The RTA's Parramatta Valley regional cycleway shares the eastern footpath between Iron Cove Bridge and The Crescent.

Adjacent land uses are mainly commercial. Residential areas (low, medium and high density) are concentrated between Iron Cove Bridge and Terry Street. There are some industrial uses between Gordon Street and The Crescent on the northern side of Victoria Road. There are large areas of public open space on the foreshore of Iron Cove and smaller pockets along the corridor to The Crescent. There is also a public school on Darling Street that has a boundary on Victoria Road.

2. PROPOSED DEVELOPMENT

The Roads and Traffic Authority (RTA) proposes to upgrade Victoria Road between Westbourne Street, Drummoyne and The Crescent, Rozelle. The Victoria Road upgrade project is proposed to improve the reliability and efficiency of bus services by providing bus priority measures. To achieve this, the RTA proposes to implement a tidal flow scheme through Drummoyne, reallocate road space in Rozelle and construct an additional bridge over Iron Cove. The project also proposes to rationalise bus stop locations and provide a new shared-use pedestrian and cyclist path on the new bridge.

Once implemented, the project would provide:
- a citybound AM and PM peak bus lane through Drummoyne;
- a citybound 24-hour bus lane on existing Iron Cove Bridge;
- a citybound AM peak bus lane through Rozelle; and
- an outbound AM peak bus lane on the new bridge over Iron Cove.

The road works proposed for the Drummoyne and Rozelle sections would follow the existing alignment of Victoria Road. The new bridge would have a curved alignment to the west of Iron Cove Bridge. Land-based elements of the bridge including the approaches, abutments, and pier structures would extend outside the existing road footprint in Rozelle and Drummoyne. These elements would still be largely within the road reserve, and merge with the existing Victoria Road alignment.

2.1 Project Description

The project would comprise three main groups of work involving the following elements:

*Road works in Drummoyne (*refer to Figure 2*)*:
- provision of a tidal flow scheme;
- provision of a citybound bus lane that would operate during the AM and PM peak periods;
- rationalisation of bus stop locations to improve the efficiency of bus services;
- modification of intersection arrangements including at Lyons Road, Park Avenue, and Cary Street; and
- modification of the existing outbound bus bay near Lyons Road.

*Bridge works at Iron Cove (*refer to Figure 3*)*:
- building an additional bridge over Iron Cove for outbound traffic;
- the new bridge would have three lanes, one of which would operate as an outbound AM peak bus lane, and a shared-use pedestrian and cyclist path; and
- the existing bridge would be dedicated for citybound traffic and would include a 24-hour bus lane.

*Road works in Rozelle (*refer to Figure 4*)*:
- changing lane configurations, turning manoeuvres and median widths to allow the operation of a citybound bus lane during the AM peak period;
- rationalisation of bus stop locations to improve the efficiency of bus services;
- modification of intersection arrangements including at Terry Street, Darling Street, Gordon Street and Evans Street; and
- modification of the existing outbound bus bay near Toelle Street.

Apart from these main design elements, the project would also involve the following general ancillary works:
- continuing investigations into the need for additional bus bays in the citybound direction;
- providing a connection to the new shared-use pedestrian and cyclist path from the Bay Run in King George Park, signalised and modified pedestrian crossings at some intersections, and additional pedestrian fencing;
- traffic management systems, including re-installing or relocating traffic signals at selected intersections and installing overhead signage structures along the project corridor; and
- upgrading or providing new general road features, including bus lane markings, pavement markings, pavement lights, fencing, redirective kerb, signage and lighting.

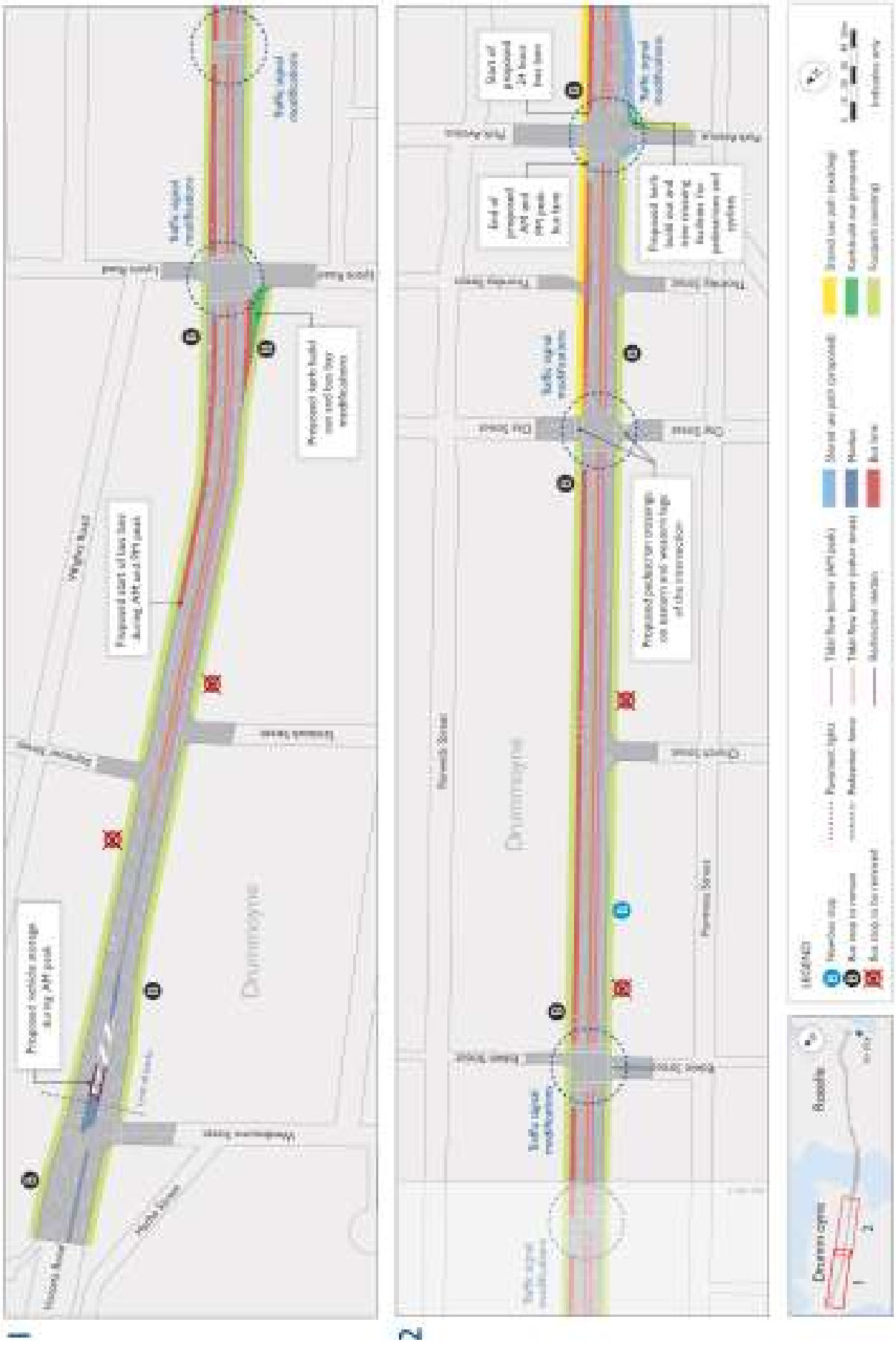


Figure 2 – Drummoyne section main design elements (RTA 2009)

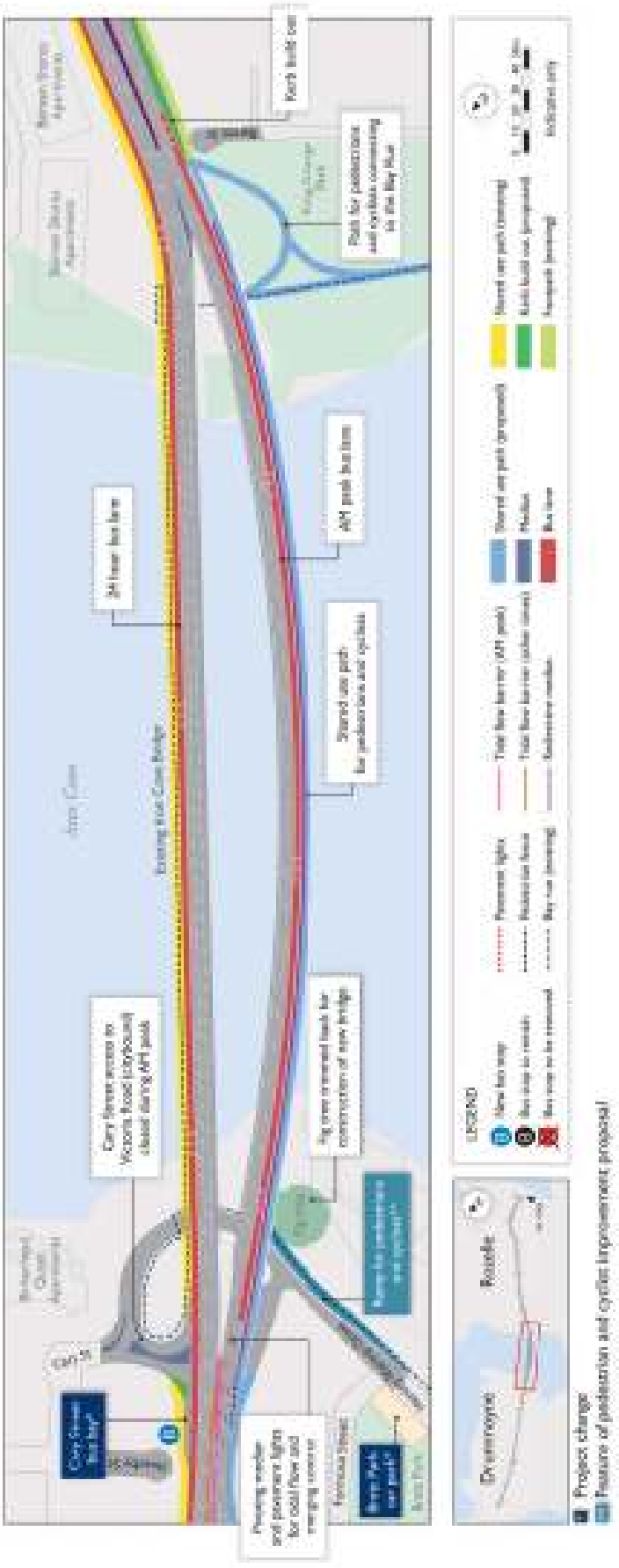


Figure 3 – Iron Cove Bridge section main design elements (RTA 2009)

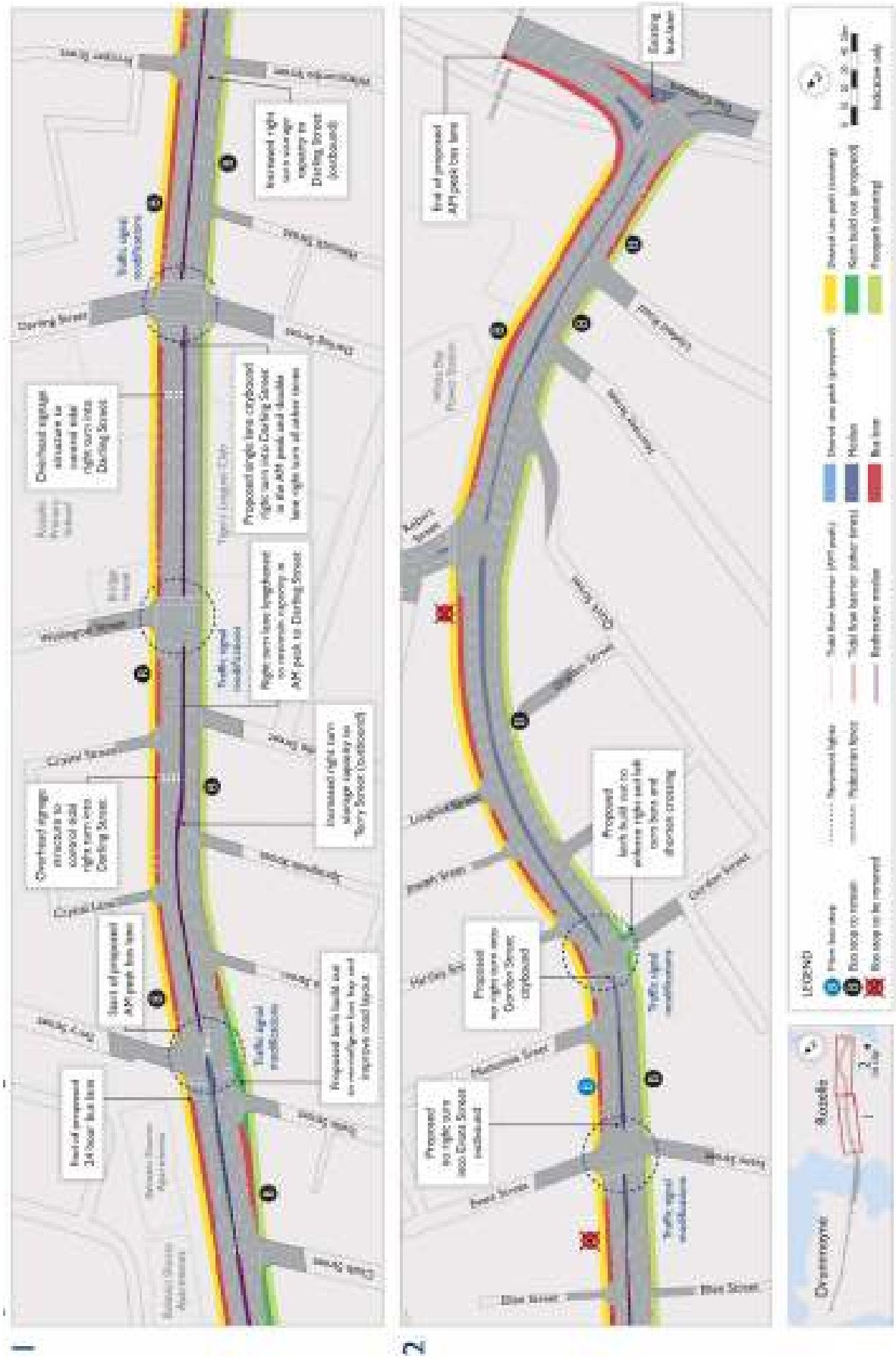


Figure 4 – Rozelle section main design elements (RTA 2009)

During construction, a number of temporary construction and compound sites would be required for purposes such as construction activities, staff facilities, equipment and material storage, and potentially a pre-cast facility. Individual construction and compound sites may be used for different purposes for two categories of works: bridge works and road works.

The bridge works would occur at the King George Park, Rozelle and Henley Marine Drive, Drummoyne sites during the day. Parts of these construction sites would become part of the approaches to the new bridge.

Additional sites would also be required for road works at various times during construction. These compound sites may be required to store materials and equipment, and provide worker facilities. While some of the proposed locations are in the project corridor, others are at discrete locations close to the construction area (location of compound sites is shown in Figure 5).

There would be three site categories, as shown in Figure 5 and summarised below:

- Construction site (King George Park) – support bridge construction activities and include main compound facilities including project office.
- Construction site (Henley Marine Drive) – support bridge construction activities and form the permanent northern abutment and piers of the new bridge.
- Category 1 compound site – storage facility; site office and worker facilities; stockpiling; fuel storage; concrete washout; and parking.
- Category 2 compound site – storage facility; worker facilities; and stockpiling.

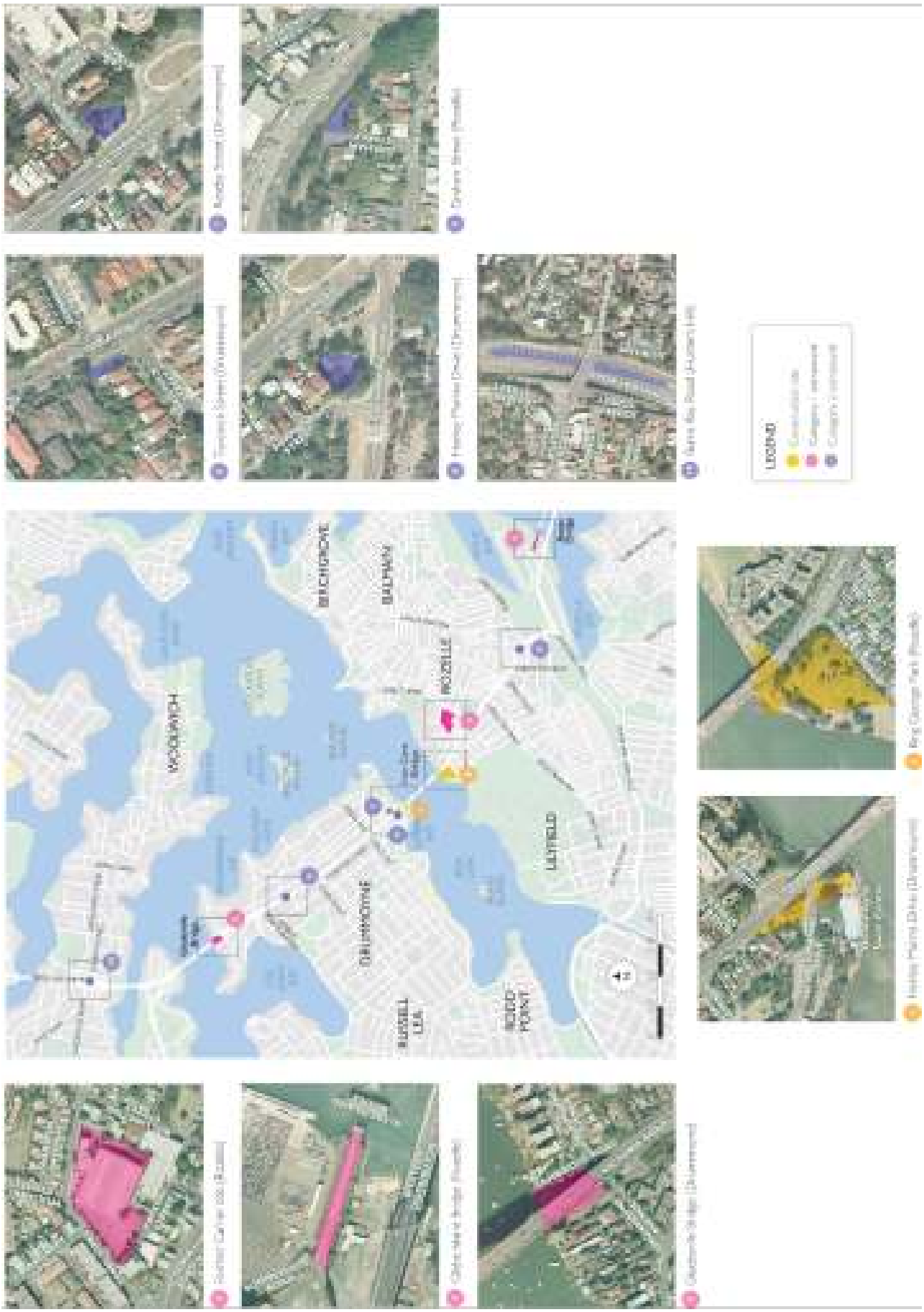


Figure 5 – Construction sites and potential compound locations (RTA 2008)

A summary of the key operational features of the project, as shown in Figures 2 to 5, is provided in Table 1 below.

Table 1 – Key Operational Features of the Project

Component	Summary Description
	MAIN PROJECT ELEMENTS
Drummoyne tidal flow scheme	The purpose of the tidal flow scheme proposed for Drummoyne is to enable a citybound bus lane in the AM and PM peaks without reducing the existing number of general traffic lanes or widening the road footprint. The tidal flow scheme would be implemented by removing the existing median and using a quickchange moveable barrier system. Mechanical pivoting medians would be installed at either end of the tidal flow scheme to control traffic while the lane reconfiguration is taking place, and during the operation of the tidal flow.
Iron Cove crossing	A new bridge over Iron Cove to the west of the existing bridge to enable the introduction of a citybound bus lane on the existing bridge without reducing the number of general traffic lanes in either direction. The proposed bridge would consist of three traffic lanes, including an AM peak outbound bus lane, and a shared-use pedestrian and cyclist path. The existing bridge would carry traffic in the citybound direction, operating with three general traffic lanes and a 24-hour bus lane. Construction of a new bridge would allow closure of the clip-on traffic lane, which would be retained for use in future planned maintenance activities, following which it is proposed to be removed (subject to a separate environmental assessment).
Rozelle lane reconfiguration	In Rozelle, it is proposed to introduce an AM peak citybound bus lane, continuing from Iron Cove Bridge to The Crescent, while also maintaining three general traffic lanes in both directions. This would be achieved by: - undertaking minor road works such as relocating existing medians where required and installing redirective kerb in selected areas; - converting the existing T3 lane to an AM peak bus lane; - intersection modifications; and - bus stop changes.
	ANCILLARY FACILITIES
Intersection modifications	Modifications at a number of intersections along the project corridor, at: Lyons Road; Park Avenue; Cary Street; Terry Street; Darling Street; Gordon Street; and Evans Street.
Bus bay facilities	Existing bus bays on the outbound carriageway at Lyons Road and Toelle Street would be modified to improve their functionality. At these intersections the kerb line would be changed to improve the bus bay alignment. This would be done by building the kerb out and would not encroach on the existing footpaths.
Pedestrian and cyclist facilities	A connection to the pedestrian and cyclist path on the new bridge would be provided from the Bay Run on the foreshore of Iron Cove in Rozelle. In Drummoyne, the shared-use path would continue along Victoria Road to Park Avenue where new crossing facilities would be installed to connect with the existing shared-use path on the eastern side of the road. A proposal for a priority cycleway through Drummoyne and Rozelle would be the subject of separate environmental assessment.
Traffic management system	Where an existing traffic signal in the median would be affected by the removal of the median, the affected signal would be replaced with a mast-arm structure. In addition to traffic signals, bus lane enforcement cameras and additional CCTV traffic monitoring cameras may be installed. Intelligent transport systems conduits would be installed where necessary to link the new traffic management infrastructure into the RTA Transport Management Centre system. Overhead signage structures would be installed, as well as variable message signs and/or changeable message signs.
Construction and compound sites	The project would require two main construction sites for the duration of the project, located at King George Park and in the two car parks adjacent to the existing bridge on Henly Marine Drive. Parts of these construction sites would become part of the approaches to the new bridge. Additional sites would also be required for compound areas at various times during construction, to store materials and equipment, and provide worker facilities.

2.2 Project Need and Justification

Victoria Road is a strategic bus corridor identified in the *Ministerial Review of Bus Services* commissioned by the then Minister for Transport Services and chaired by the Hon Barrie Unsworth. Relevantly, the Review recommended that transport and planning agencies progress assessment of the identified strategic bus corridors to:

- prioritise the strategic corridors according to the need for, and impact of, bus priority measures;
- determine, case by case, the level of infrastructure required and the associated costs;
- develop an expanded bus priority program (including additional revenue sources); and
- implement electronic enforcement measures in parallel with bus priority measures.

Based on the findings and recommendations of the Review, the RTA has conducted travel time surveys for each of the strategic bus corridors to identify areas of low average bus speeds, and where such conditions are identified, to develop options to improve travel speed and bus service reliability. The section of Victoria Road through Drummoyne and Rozelle was identified as one such location, particularly as a result of congestion during the morning traffic peak.

The Environmental Assessment prepared for the upgrade identifies that Victoria Road is one of Sydney's busiest transport corridors, and by the RTA's own counts, carried approximately 175,000 vehicles each day in 2007. Traffic counts at the Iron Cove Bridge were slightly higher for citybound traffic (40,500 AADT) compared with outbound traffic (34,500 AADT).

In the same year, it also carried some 35,000 passengers on 1,500 buses (783 citybound and 701 outbound). The Victoria Road corridor becomes highly congested during peak traffic periods, particularly in the morning, and travel times for passenger vehicles is highly variable (between 20 and 63 minutes for trips from the proposed upgrade site to the CBD during morning peaks, and between 5 and 17 minutes during afternoon peaks).

Victoria Road between Drummoyne and Rozelle currently carries a generally unseparated mix of bus and passenger vehicle traffic. Although T3 transit lanes currently exist in the area (citybound during morning peaks), these lanes do not operate effectively (ie non-T3 traffic regularly uses these lanes as an overflow from standard traffic lanes) thereby largely negating any benefit the T3 lanes may otherwise provide for bus traffic.

Elevated bus travel times into the CBD (particularly during morning peak periods) and reduced bus reliability (ie highly variable bus travel times) are principally caused by the interaction and peak period conflict of bus and passenger vehicle traffic in a highly congested and capacity-constrained corridor.

Therefore, to address the above issues, the Victoria Road upgrade aims to address reduced bus reliability and elevated bus travel times by separating bus and general traffic through the installation of dedicated bus lanes. The dedicated bus lanes will be supported by tidal flow arrangements and additional Iron Cove bridging capacity to ensure that the existing situation for passenger vehicles is not worsened.

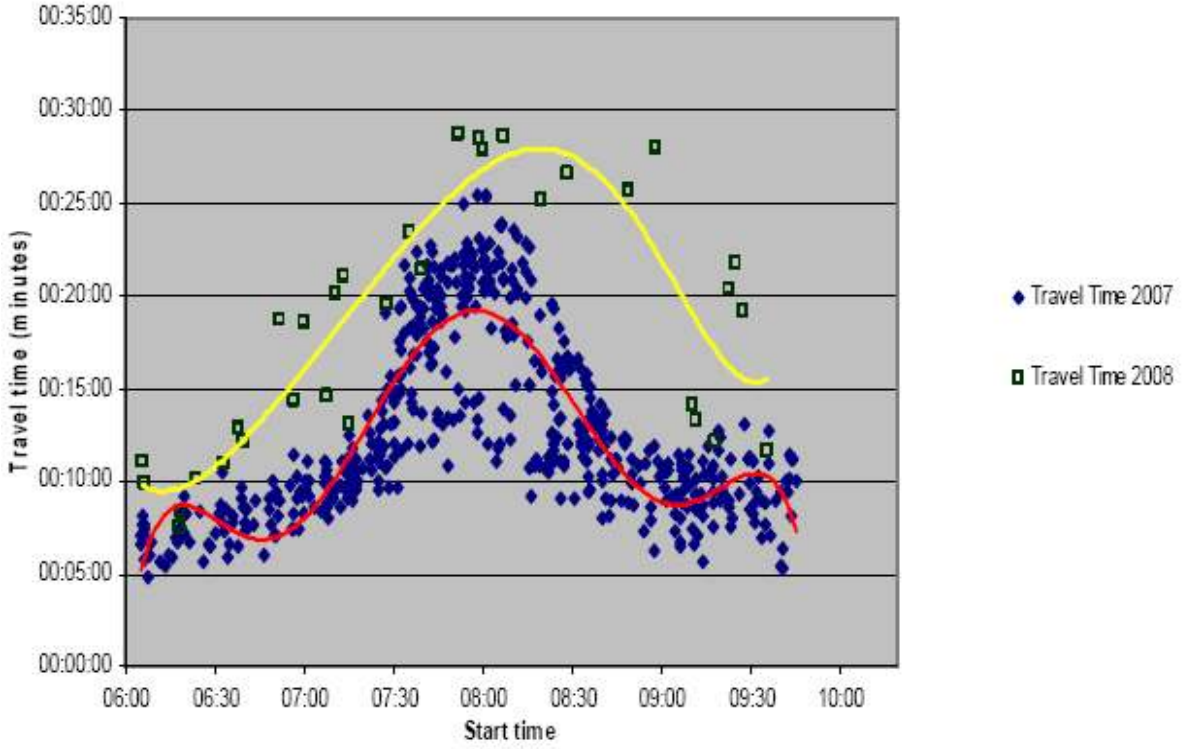
It is important to highlight this priority distinction given that a significant proportion of public submissions expressed opposition to the project based on it not delivering reductions in traffic congestion along Victoria Road. The project is intended as a public transport initiative and is not intended to address general traffic congestion issues. The RTA considers the project necessary primarily as a public transport priority project aimed at bus services in the Victoria Road strategic bus corridor.

The Environmental Assessment presents survey data from 2007 and 2008 for citybound morning peak bus services on Victoria Road (reproduced as Figure 6). The survey data provides a reasonable indication of the bus travel time and reliability issues. It is clear that bus travel times are highly variable across the morning peak period, both as a function of time across the peak period (eg travel times vary from 6:00 am to 8:00 am) and for any particular time within peak period (eg a bus at 8:00 am can take anywhere from 10 minutes to 30 minutes).

This supports the need to address the bus *reliability* issue as a bus commuter cannot reliably predict the likely travel time of any particular bus service in the peak traffic period due to the high variability in bus travel times.

The data also indicates that bus speeds are adversely affected, particularly around the middle of the peak period. While travel times would also be affected by demand (increased dwell times), the data presented in the Environmental Assessment indicates a stronge relationship between travel times and congestion (ie total traffic in the peak period). This highlights the need to address the bus *travel time* issue, for example a bus commuter is less likely to rely on bus transport in cases where it does not offer an acceptable trip duration.

Figure 6 - Citybound Morning Bus Travel Time Survey Results



The RTA has undertaken predictive traffic modelling to establish indicative travel time improvements associated with the project. The outcomes of this modelling are presented in the table below.

Table 2 - Expected Travel Time Reductions (Citybound Morning Peak)

Time Period	Number of Citybound Passengers	Current Average Travel Time	Expected Average Travel Time	Average Travel Time Saving
7:00-7:30	980	17:52	10:26	7:26
7:30-8:00	1,897	25:33	10:22	15:11
8:00-8:30	2,098	27:05	9:53	17:12
8:30-9:00	1,502	26:53	10:48	16:05
9:00-9:30	797	16:49	10:00	6:49
9:30-10:00	322	11:40	10:00	1:40

The Department accepts that there will be reductions in travel times and also considers it relevant to focus on travel time variability. The predicted decreases in travel times presented by the RTA are a direct result of removing the cluster of high travel time trips generally between 7:30 am and 8:30 am. This links back to the issue of bus trip reliability, noting that in addressing this cluster of high travel time trips, the project is in fact increasing the probability that any particular bus will operate close to an 'ideal' travel time (in this case, data suggests that 'ideal' is in the range of five to ten minutes).

In summary, the Department considers that

- the project will benefit bus commuters on citybound trips particularly between 7:00 am and 9:00 am on weekdays both in terms of travel time savings and reliability; and

- the proposal supports Government policy to encourage public transport and to afford priority to measures to improve bus transport along strategic bus corridors and is consistent with the recommendations of the *Ministerial Review of Bus Service.*

Other benefits which also add weight to the project include:
- improvement to safety aspects of the road environment;
- improvements to pedestrian and cyclist facilities and connectivity; and
- better options for the management of traffic during major maintenance and refurbishment of the existing Iron Cove Bridge where lane closures would be required.

Finally, the Department is satisfied that the RTA has, in the Environmental Assessment, adequately addressed the Director-General's requirements relating to justification.

2.3 Project Options

The RTA undertook an analysis of a range of options, based on both RTA investigations and stakeholder consultation. Fourteen broad alternatives were initially identified:
1. Do nothing.
2. Tidal flow arrangements to provide bus lane (Drummoyne only).
3. Lane reconfiguration to provide bus lane (Rozelle only).
4. Conversion of T3 transit lanes to bus lanes.
5. Road widening for bus lanes (Drummoyne only).
6. Tunnels and interchanges.
7. Road viaducts.
8. New multi-lane bridge over Iron Cove.
9. Single-lane bus-only bridge over Iron Cove.
10. Widening Iron Cove Bridge.
11. Replacing iron Cove Bridge.
12. Light Rail.
13. Road pricing (tolls).
14. Extend and enforce the transit lane.

The 14 alternatives were considered in a range of combinations across the corridor, and refined through consideration of each combination against the project objectives, value for money, realisation of early benefits, engineering constraints, safety, and environmental considerations.

The preferred solution reached as a result of the Environmental Assessment, and refined following public exhibition of the proposal, is consistent with relevant State Government plans, strategies and policies and directly addresses current bus reliability and efficiency issues in the Victoria Road corridor. It also responds to growing demand for bus services by providing the bus priority infrastructure necessary to allow the provision of additional services.

When compared to other potential alternatives, and assessed against the project objectives, the project was preferred on the grounds of value for money, environmental and engineering considerations.

2.4 Preferred Project

As a result of the public exhibition process, the following design changes and minor modifications have been made.

<u>Road works in Drummoyne.</u>
- This part of the project would involve providing an AM peak tidal flow scheme and citybound bus lane that would operate during the AM and PM peak periods.
- The Quickchange Moveable Barrier (QMB) system has been confirmed as the preferred tidal flow method.
- Investigations have identified an opportunity to replace the existing citybound Park Avenue bus stop during the AM peak with a bus bay at Cary Street, to be located in the existing left-turn slip one on the approach to Cary Street.
- Investigations into parking arrangements have determined that a car park situated in a section of Brett Park at the intersection of Henley Marine Drive and Formosa Street would best reduce the impact of construction of the project on parking near Iron Cove Bridge in Drummoyne.

Bridge works at Iron Cove.

- This part of the project would involve building an additional bridge over Iron Cove for outbound traffic and shared pedestrian and cyclist facilities.
- The shared-use path over the new bridge widened from 3.6 metres to 4.3 metres.

Road works in Rozelle.

- This part of the project would involve changing lane configurations, turning manoeuvres and median widths to allow the operation of a citybound bus lane during the AM peak period.

Ongoing investigations will be carried out as required to further progress detailed design, or as committed to assist the implementation of management and mitigation measures during the construction and operation of the project. Ongoing refinements may continue during detailed design development.

In addition to the preferred project, the RTA has been undertaking a study of pedestrian and cyclist improvements. These will be the subject of a separate assessment and approval. The concept design of these improvements would include providing alternative cycle routes to Victoria Road through Drummoyne and Rozelle and a ramp connecting the new bridge to the Bay Run at Henley Marine Drive in Drummoyne.

3. STATUTORY CONTEXT

3.1 Part 3A of the Act

By way of an Order published in the Government Gazette on 21 December 2007, the Minister for Planning declared under section 75B(1) of the *Environmental Planning and Assessment Act 1979* (the Act) that the project would be subject to Part 3A of the Act. It therefore requires the Minister's approval.

3.2 Permissibility

Pursuant to clause 94 of the *State Environmental Planning Policy (Infrastructure*) (2007), development for the purpose of a road or road infrastructure facility may be carried out by or on behalf of a public authority without consent on any land. The project is therefore permissible.

3.3 Relevant Environmental Planning Instruments

State Environmental Planning Policy No 55 – Remediation of Land applies to the project. The policy aims to promote the remediation of contaminated land in order to reduce the risks to human health and the environment. Where land is contaminated, the policy requires that it is suitably remediated prior to any development taking place on it. This issue is discussed within Section 5.2 of this report.

State Environmental Planning Policy (Infrastructure) Amendment (Metro Rail) 2009 applies to the project. The policy aims to identify a rail corridor for the proposed city metro and to ensure that development on, or adjacent to, land within that corridor does not adversely affect the viability of the proposed metro or any proposed metro station. Where development near proposed metro stations is proposed, the policy requires consideration of whether the proposed development will adversely affect the development and operation of a proposed metro station, and whether the proposed development will encourage the increased use of public transport. This issue is discussed within Section 5.1 of this report.

3.4 Minister's Approval Power

The environmental assessment was placed on public exhibition from 22 October 2008 until 25 November 2008. Submissions were invited during this period in accordance with Section 75H of the Act, and extended until 12 December 2008. The Department has met all of its legal obligations so that the Minister can make a determination regarding the project.

It is also noted that the Environmental Assessment submitted in support of the subject application adequately addressed the Director-General's requirements issued for the project application.

3.5 Commonwealth Legislation

The Proponent determined that the project would be unlikely to have a significant impact on any matter of national environmental significance (threatened species and migratory species) or potential habitat if appropriate mitigation measures are implemented. Therefore, a referral to the Commonwealth Department of the Environment, Water, Heritage and the Arts under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) was not made.

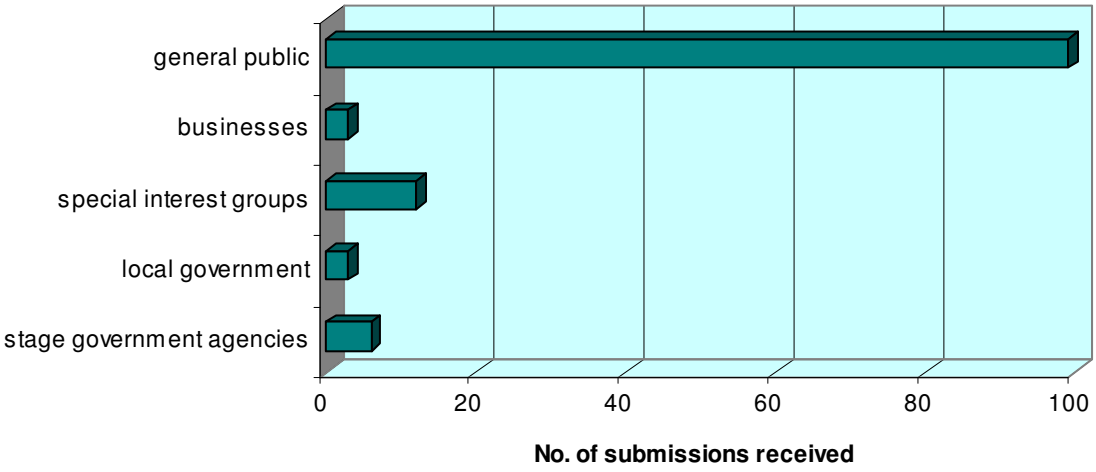
4. CONSULTATION AND ISSUES RAISED

4.1 Introduction

The Department received a total of 700 formal submissions, including 92 submissions received during the public exhibition period, and 606 additional submissions received during the extended period up to 12 December 2008. Two submissions were also accepted from government agencies post 12 December 2008. Additional submissions were also received, following the extended formal submission period ending on 12 December 2008, and the issues raised have been considered in this report.

Of the submissions received, a total of 123 were individually prepared submissions and a total of 577 submissions were one of four types of form letters. Figure 6 shows the relative sources of feedback of the 123 individually prepared submissions.

Figure 6 – Submissions by source type



Special interest groups included the Action for Public Transport and NRMA Motoring, Friends of King George Park, and sports clubs including sailing, rowing and football clubs.

Figure 7 below, shows a summary of the issues raised in submissions, indicative of the 123 individually prepared submissions only, and not including generic issues raised in the 577 form letters received.

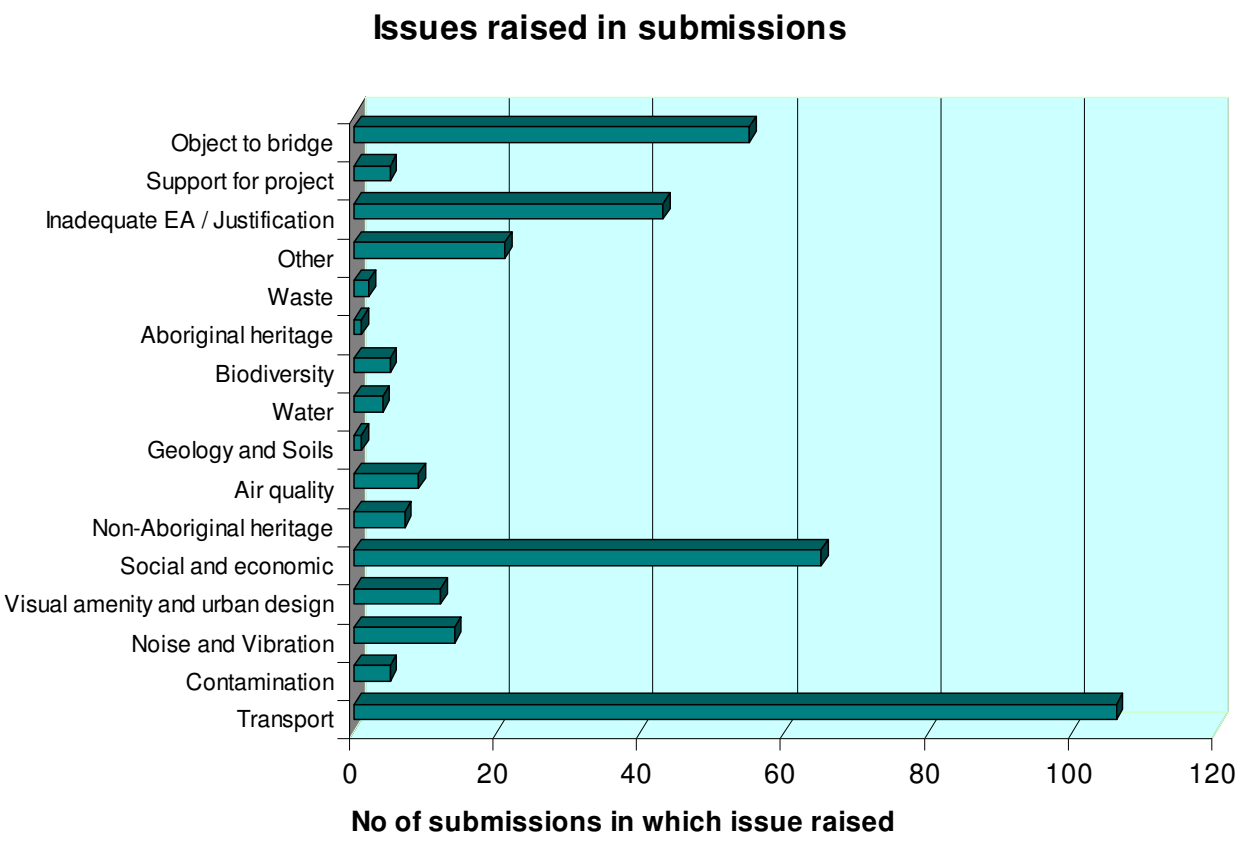
The individually prepared submissions show high interest in the following issues:

- transport issues, including public transport and traffic congestion / management;
- objection to the bridge;
- social and economic issues; and
- inadequate environmental assessment / justification.

The form letters also raised the following issues:

- transport issues, including bus improvements and traffic congestion / management;
- value for money;
- inadequate environmental assessment / justification;
- global warming and reduction of carbon emissions;
- objection to the bridge; and
- loss of open space / reduction of recreation areas.

Figure 7 – Issues raised in submissions



4.2 Submissions from the General Public, Businesses and Special Interest Groups

The public submissions consisted of 114 individually prepared correspondence from local residents, local businesses, and special interest groups, as well as 577 form letters.

Of these submissions, eleven generally / conditionally supported the proposal, nine did not state a position, two raised concerns with the proposal, and 668 objected to the proposal on various grounds. The 577 form letters received were in objection to the proposal. A number of the opposing submissions identified their objection to the second Iron Cove Bridge, but supported improving intersections along Victoria Road, and the provision of dedicated bus lanes.

Key issues raised in the submissions are summarised below and further addressed in the following chapter.

Project need and alternatives
- relationship to strategic planning and policy;
- objection to the construction of a new bridge;
- justification in light of alternative Government infrastructure or service needs;
- justification of the project against benefits; and
- benefit / cost ratio.

Traffic congestion and management
- traffic congestion along Victoria Road;
- traffic congestion on Anzac Bridge and in the CBD; and
- increasing capacity for general traffic.

Public transport
- public transport alternatives;
- bus improvements;
- bus lanes; and
- T3 lane enforcement.

Cyclist / pedestrian opportunities
- safety for pedestrians; and
- pedestrian and cycleway improvements.

Project alternatives
- alternative bridge location;
- alternative bridge design; and
- tunnel option.

Social and economic
- business viability and sustainability;
- affect on the local community;
- affect on waterway users, particularly the rowing community; and
- local area and amenity impacts.

Other environmental impacts
- air pollution;
- contamination;
- heritage;
- noise and vibration; and
- visual amenity and urban design.

4.3 Submissions from Government Agencies

The Department received submissions from the Department of Primary Industries, Department of Environment and Climate Change, Department of Water and Energy, Ministry of Transport, NSW Maritime, and the Sydney Metro Authority.

None of the agencies stated an explicit position but identified a number of key issues for further consideration/information. Key issues raised in the submissions are summarised below and further addressed in the following chapter.

Department of Primary Industries
The Department of Primary Industries (DPI) reviewed the proposal in light of the policies and provisions under the *Fisheries Management Act 1994*, and raised no objections providing the mitigation measures in the draft Statement of Commitments are implemented. In particular the DPI identified a number of issues in relation to management of acid sulphate soils and erosion and sediment control.

Department of Environment and Climate Change
The Department of Environment and Climate Change (DECC) provided a number of comments regarding the exhibited Environmental Assessment for inclusion into the RTA's Statement of Commitments or for consideration as draft Conditions of approval. In particular, DECC raised a number of issues in relation to operational road noise, construction noise management, protection of the waterway including aquatic biota and habitat, and waste management.

Department of Water and Energy
The Department of Water and Energy (DWE) provided a number of comments regarding in particular protection of riparian vegetation and groundwater issues identified within the exhibited Environmental Assessment.

Ministry of Transport
The Ministry of Transport (MoT) provided a number of comments regarding in particular bus operations, the need for a priority cycleway through Drummoyne and Rozelle, and the implications for the project of the CBD Metro proposed in the 2008 November mini-budget.

NSW Maritime
NSW Maritime's principal interest in relation to this project is with respect to any works on and over the bed of Iron Cove, as the owner of the bed of Sydney Harbour and commuter wharves, and in relation to the agency's responsibilities for boating safety. In particular, NSW Maritime raised a number of issues in relation to the bridge design, navigation requirements, and mitigation of potential environmental impacts to the waterway during construction activities.

Sydney Metro Authority
The Sydney Metro Authority provided a submission on the proposal in light of the proposed CBD Metro project. Given the limited available road space, there is a need to clarify potentially competing objectives with the CBD Metro project.

4.4 Submissions from Local Government

Submissions were received from Leichhardt Municipal Council, City of Canada Bay Council and City of Sydney Council. Key issues raised in the submissions are summarised below and further addressed in the following chapter.

Leichhardt Municipal Council
Leichhardt Council has submitted a recommendation that the proposed Victoria Road Upgrade not be approved in its present form. Leichhardt Council supported the RTA's objective of improving the efficiency and reliability of bus services on Victoria Road, and improvements to cyclist and pedestrian facilities in Drummoyne and Rozelle, however recommended that the RTA not proceed with the current proposal to duplicate the Iron Cove Bridge and reconsider alternatives.

City of Canada Bay Council
City of Canada Bay Council has submitted a recommendation that the proposed Victoria Road Upgrade not be approved in its present form. In particular, Council raised a number of issues in relation to traffic, pedestrian and cyclist safety, loss of parking, local community accessibility and issues regarding the construction of the bridge.

City of Sydney Council
City of Sydney Council is committed to working with the State Government to improve public transport priority, and walking and cycling into and around central Sydney, however has stated concern about the project and its potential to facilitate additional traffic movement into central Sydney.

4.5 RTA Submissions Report

The Department required the Proponent to prepare a Submissions Report. As part of this process, the Proponent made specific comment in relation to each issue identified. The RTA's Submissions Report, including a revised Statement of Commitments, is attached as Appendix C.

Following consideration of the submissions, and additional development of the concept design, the Proponent proposed two significant amendments and four minor amendments to the project as follows:

Cary Street Bus Bay
- Investigations have identified an opportunity to replace the existing citybound Park Avenue bus stop during the AM peak with a bus bay at Cary Street about 75 metres away.
- The bus bay would be located in the existing left-turn slip lane on the approach to Cary Street. The bus bay would include a bus shelter, a widened footpath to allow pedestrian and cyclist access around the shelter, and a new raised shared-use path connecting users to the Cary Street crossing point.
- The design modification would improve travel times for some buses in the AM peak by allowing express buses, or buses at capacity, to remain in the dedicated bus lane and continue past the bus stop without queuing behind stopped buses.
- The impacts of the change would generally be consistent with those described in the environmental assessment.

Brett Park compensatory car park
- Investigations have determined that a car park situated in a section of Brett Park at the intersection of Henley Marine Drive and Formosa Street would, on balance, best reduce the impact of construction of the project on parking near Iron Cove Bridge in Drummoyne.
- It would include up to 27 parking spaces, with entry and exit point from Henley Marine Drive.

- There is an opportunity for Canada Bay Council to request that it be designed and constructed as a permanent car park prior to its final design.
- While the change would result in temporary impacts such as noise and vibration and traffic disruptions, it is considered that overall the change would reduce impacts of the project. The car park would minimise the impacts of the loss of parking near Iron Cove Bridge in Drummoyne during construction of the project.

Minor design modifications

- Share-use path on the new bridge over Iron Cove – the shared-use path widened from 3.6 metres to 4.3 metres, providing further improvements for pedestrians and cyclists crossing Iron Cove.
- New shared-use crossing – provision of a new shared-use crossing on the western leg of Park Avenue only, minimising the impact of a southern leg crossing on traffic.
- Cary Street pedestrian crossing – proposed crossing removed from the design to improve safety at this intersection.
- Pedestrian fencing – pedestrian fencing removed from the bus stop near Terry Street to improve safety in relation to sight distances.

The Department considers that these amendments are acceptable and do not significantly change the nature and scope of the original proposal nor will they result in additional adverse impacts. As such, a Preferred Project Report was not required for the project.

The Submissions Report was forwarded for comment to the Department of Primary Industries, Department of Environment and Climate Change, Department of Water and Energy, and NSW Maritime. Agencies comments have been taken into consideration in preparing the Department's recommended conditions of approval.

5. ASSESSMENT OF ENVIRONMENTAL IMPACTS

After consideration of the RTA Environmental Assessment, submissions, RTA Submissions Report, and Government agency responses to the Submissions Report, the Department has identified the following key environmental issues associated with the proposal:

- construction and operational transport and traffic impacts;
- potential water contamination impacts;
- construction and operational noise impacts;
- visual amenity and urban design, particularly bridge design;
- social and economic impacts; and
- non-Aboriginal heritage impacts.

The Proponent has also assessed the potential impacts of the project on air quality, geology and soils, water, biodiversity, Aboriginal heritage, waste minimisation and management, climate change and greenhouse gas emissions, hazards and risks, and cumulative impacts. These issues are considered to be relatively minor and although adequately assessed, require consideration and specific conditions of approval. The Department's consideration of these issues is addressed in Section 5.7.

5.1 Transport

Issues Raised in Environmental Assessment

Victoria Road is one of Sydney's busiest transport corridors, carrying approximately 75,000 vehicles and 35,000 passengers on nearly 1,500 buses per average weekday across Iron Cove. Some 29 bus routes traverse all or part of Victoria Road through Drummoyne and Rozelle with various origins and destinations.

The Bay Run, a particularly popular and important leisure circuit around Iron Cove taking in Iron Cove Bridge attracts high numbers of pedestrians and cyclists. The Parramatta Valley Cycleway also passes through Drummoyne and Rozelle and connects via the Bay Run cycleway to the Hawthorne Canal cycleway.

Iron Cove is a major rowing precinct in Sydney Harbour, providing the only remaining 2 kilometre rowing course in Sydney Harbour. Recreational users include several rowing clubs, dragon boat clubs and sailing clubs, and frequent training and regatta events are held throughout the year.

Project objectives

Network and micro-simulation traffic modelling was used to predict the performance of the project against the following objectives and indicators.

Objective 1: Improve the efficiency of bus services on Victoria Road through Drummoyne and Rozelle as defined by peak period bus travel times.

- Indicator 1: Reduction in average bus travel time – AM peak citybound.
  Under existing conditions, bus travel times increase substantially during the AM peak citybound. Modelling predicts that the project would result in bus travel times between Westbourne Street and The Crescent of around 10 minutes, with reductions in bus travel times of up to 18 minutes.
- Indicator 2: Reduction in average bus travel time – PM peak citybound.
  Travel times for citybound buses travelling during the period 5pm to 7pm currently range from around five to 17 minutes. Modelling predicts that during this period the project would result in average travel times for buses of between nine and ten minutes, suggesting a travel time saving of up to eight minutes would be possible.

Objective 2: Improve the reliability of bus services on Victoria Road through Drummoyne and Rozelle as defined by reduced variability in peak period bus travel times.

- Indicator 3: Reduction in maximum travel time for buses – AM peak citybound.
  Under existing conditions, buses are able to travel along Victoria Road with relatively consistent travel times during all periods of the day except the AM peak. Variability during the AM peak makes bus services highly unreliable, reducing the predictability of journey times. Modelling predicts that by providing a dedicated bus lane, the project would enable free-flowing bus travel, provide more consistent travel times and therefore more reliable bus services. The modelled variation in bus travel times under existing conditions is about 25 minutes while under project conditions it is only about five minutes.

Objective 3: Maintain peak direction traffic flow as defined by travel times.

- Indicator 4: Variation from existing peak direction travel times for general traffic times is not significant.

Travel times for citybound general traffic along this section of Victoria Road were recorded during traffic surveys to be between 20 and 63 minutes in the period from 7am to 9am. With the project in place, modelling predicts that, on average, travel times would reduce by about one minute in the AM peak citybound and by less than half a minute in the PM peak outbound. The traffic model confirms that this variation in travel times for general traffic would continue following completion of the project. Travel time changes are small and the impact of the project on general traffic travel times is considered insignificant.

Road network performance and efficiencies

Construction work would have some impacts on vehicular, pedestrian and cyclist traffic. The majority of the road work would require lane closures at different stages during the construction period. It is envisaged that most road work would occur at night. Traffic data indicates that traffic flows show a marked reduction after 8pm and fall consistently until midnight. Between midnight and 5am, traffic flows remain low.

The majority of the vehicle movements for the bridge works would occur during standard working hours. Temporary closures of Henley Marine Drive at Iron Cove Bridge would be required to facilitate bridge works. All closures would be carried out in accordance with a Traffic Management Plan. At any time when access to private property or commercial premises would be temporarily restricted, the affected owners and community would be consulted and the minimum time possible taken to complete the relevant works.

Community concern about the potential for the project to induce traffic was identified during initial consultation. The project would effectively replace a T3 lane and two general traffic lanes with three general traffic lanes. Given the high levels of illegal T3 lane usage this represents a minor capacity improvement that is not likely to result in increased traffic throughput due to the metering effects at a number of intersections along the route. As a result neither induced traffic nor a mode shift to private vehicles is expected. The project would also not result in changes to the road capacity at The Crescent and therefore would is not expected to induce traffic growth on Anzac Bridge.

The project also involves a number of changes to local access to improve the performance of Victoria Road and these changes are expected to have minor but acceptable impacts. These changes would involve:

- closing access to Victoria Road from Cary Street during the AM peak;
- bringing the left-turn slip lane from Victoria Road (outbound) onto Park Avenue under the control of traffic signals;
- bringing the left-turn slip lane from Lyons Road onto Victoria Road (outbound) under the control of traffic signals;
- changing the intersection of Victoria Road and Terry Street;
- changing the intersection of Victoria Road and Darling Street;
- restricting the citybound right-turn to one lane during the AM peak; and
- banning certain manoeuvres such as right turns into Gordon Street citybound and Evans Street outbound.

The effects of major land use changes in the locality on the traffic assessment outcomes for the project have also been assessed. Sites of known potential property development include The Balmain Tigers site and the former Carrier site, and Callan Park. Potential longer term land developments may include White Bay, Rozelle Railway Yards, MBS Site, and Birkenhead Point. Based on the traffic modelling, the RTA does not consider that the project will affect the viability of potential developments, or that traffic from these potential developments would affect the operation of the citybound bus lane through Rozelle or the traffic assessment outcomes.

Road safety

The impacts of the project in terms of road safety have been assessed according to crash type groupings. It is anticipated that the project on a whole would have the potential to reduce the likelihood of road crashes, including vehicular and pedestrian crashes.

During construction the main potential impact to road safety would result from the need to occupy road space and the disruption of traffic flow. The works would primarily occur at night-time to reduce impacts on traffic flow during peak travel times. Night work would also reduce the risk to public safety associated with the need to obstruct sections of the road. The bridge works would largely occur outside of the existing road footprint and would therefore have minimal impact on road safety.

A number of aspects of the operation of the project would also reduce the potential for vehicular crashes, including restricting right hand turns from Victoria Road, replacing the existing mountable median with a

redirective median barrier, providing more consistent lane width, and the implementation of a tidal flow scheme. Pedestrian and cyclist safety improvements are expected from the provision of a shared-use path on the proposed bridge and the introduction of additional fencing that would direct pedestrian movements to designated crossing points.

Public transport users
The project would rationalise and relocate bus stops in Rozelle and Drummoyne to improve the reliability and efficiency of bus services, whilst maintaining the accepted bus stop catchments of 400m. In the citybound direction, the project would remove three bus stops and introduce one new one. In the outbound direction, the project would remove three bus stops and introduce one new bus stop while providing bus bays at two existing bus stops. The anticipated time saved by reducing the number of stops, and the reduced passenger loading and unloading time, would further improve bus efficiency and reliability.

During construction, the impact on public transport users would be minimal. The majority of construction activities in the vicinity of bus stops would be carried out at night or outside of peak periods.

Pedestrian and cyclist networks
The construction of the project would result in some impacts on pedestrian and cyclist movements. The main disruption would be to the Bay Run in Rozelle beneath the existing bridge, where it would be necessary to intermittently restrict public access for safety reasons and construction requirements. In other areas of the project corridor, temporary restrictions to pedestrian and cyclist access would occur at times.

The proposed new bridge would provide a second pedestrian and cyclist crossing over Iron Cove in the form of a shared-use path. Pedestrian and cyclist facilities across Iron Cove would also be enhanced by the provision of a more manageable connection to the Bay Run and recreational areas on the foreshore of Iron Cove. Other improvements to pedestrian and cyclist facilities would include new marked crossings, pedestrian stages and crossing points at a number of intersections.

As a separate project, the Proponent proposes to introduce a priority cycleway through Drummoyne and Rozelle, to provide a safe and continuous route for cyclists.

Waterway users
During construction, the use of temporary barges, jetties and platforms would obstruct some spans under Iron Cove Bridge, however access would be maintained as far as possible.

The introduction of the new bridge structure would potentially affect rowing and sailing activities in Iron Cove. The proposed bridge would maintain the same vertical clearance as the existing bridge through the two central spans, and bridge piers would align with the location of the existing bridge piers such that the same span lengths are maintained. The new bridge is considered to have a minor impact on the two kilometre rowing course by introducing additional piers to the course with pile caps that would reduce the width between piers. The shorter 1.5 kilometre and one kilometre courses would not be affected as they do not cross beneath the bridge.

Parking
There would be limited impact on parking during construction. Road works would mainly be carried out during night-time and non-peak times, resulting in localised loss of parking during those times. There would be a loss of parking during construction of the proposed bridge in the vicinity of the Drummoyne approach, equating to a temporary loss of approximately 36 marked parking spaces off Henley Marine Drive.

In the citybound direction during the PM peak, parking spaces for about 40-50 cars in Drummoyne would be lost due to the introduction of the bus lane. In the outbound direction, the proposed clearway during the AM peak in Drummoyne would also result in an overall loss of 40-50 parking spaces. Parking is available on side roads and this is considered to satisfy most of the lost parking.

There would also be a number of parking spaces lost as a result of the proposed bridge pier locations in the car park next to, and opposite The Cove at Drummoyne café. It is anticipated that reconfiguration of the car park next to the café would allow 21 of the existing 24 spaces to be retained. In the car park across the road from the café, nine of the existing 12 spaces could be lost.

Issues Raised in Submissions

The key concerns raised in the public submissions broadly include:

Bus priority

- the project will not substantially reduce bus travel times;
- benefits claimed for buses are only short-term; and
- bus services in the morning are often overcrowded with insufficient capacity to pickup queuing passengers and increasing tolls will put further pressure on congested bus services.

Traffic congestion / management

- the congestion on Victoria Road is caused by the intersection of Victoria Road with Lyons Road in Drummoyne, and Darling Street and The Crescent in Rozelle, and the proposal would be ineffective in alleviating this;
- the new bridge would not solve the problem of congestion on Victoria Road;
- the environmental assessment failed to address potential constraints of the existing road network;
- the project would create and re-distribute bottlenecks, including to the Anzac Bridge and the CBD;
- businesses relying on transporting goods along this route will be impacted as cars currently using the T3 lane would be forced back into the general traffic lanes, increasing general traffic and increasing general traffic travel times;
- the project would result in extra road capacity for general traffic and encourage private vehicle use instead of public transport;
- the proposed closure of Cary Street during the AM peak and impact this could have on local traffic in the area;
- the impact of proposed access changes along the project corridor including redirection of traffic; and
- delays on side streets leading to and across Victoria Road as a result of the project.

Pedestrians and cyclists

- pedestrian and cyclist safety; and
- pedestrian and cyclist access.

Bridge design / waterway users

- the impact the proposed new bridge would have on waterway use, in particular rowing and sailing courses;
- bridge design issues; and
- potential safety issues for passive recreational use and rowing on the Iron Cove.

City of Canada Bay Council submitted the following transport related issues / comments:

- traffic issues, particularly: removal of slip lane from Lyons Road to Victoria Road intersection (outbound); Victoria Road and Park Avenue Intersection; Cary Street / Victoria Road intersection; Cary Street closure; and Lyons Road;
- pedestrian and cyclist safety;
- loss of parking in Victoria Road (between Lyons Road and Day Street), and at Henley Marine Drive;
- consideration of the Burwood to Chatswood Bus Corridor;
- local community accessibility; and
- improvements to bus operations independent of the project.

Leichhardt Municipal Council submitted the following transport related issues / comments:

- support the objective of improving the efficiency and reliability of bus services on Victoria Road;
- support improvements to cyclist and pedestrian facilities in Drummoyne and Rozelle;
- recommend that the RTA not proceed with the current proposal to duplicate the Iron Cove Bridge and reconsider alternatives; and
- recommend that the RTA not proceed with the current proposal until such time as an *Integrated Transport Plan* has been developed for the Metropolitan Area.

City of Sydney Council submitted the following transport related issues / comments:

- bus priority could be achieved along this route without the additional expense designed to maintain existing vehicle flows into the CBD; and
- opportunities for encouraging walking and cycling need to be maximised.

NSW Maritime raised the following issues relating to waterway users:

- any reduction in clearance of the outer spans of the bridge should be avoided if possible;
- it is suggested to maintain the maximum distance between piers, and to seek the views of the rowing community in relation to the alignment of the bridge piers; and

- navigation lights and signage need to be erected on the bridge (typically on the pylons) showing the clearances under each span.

MoT submitted the following transport related issues / comments:

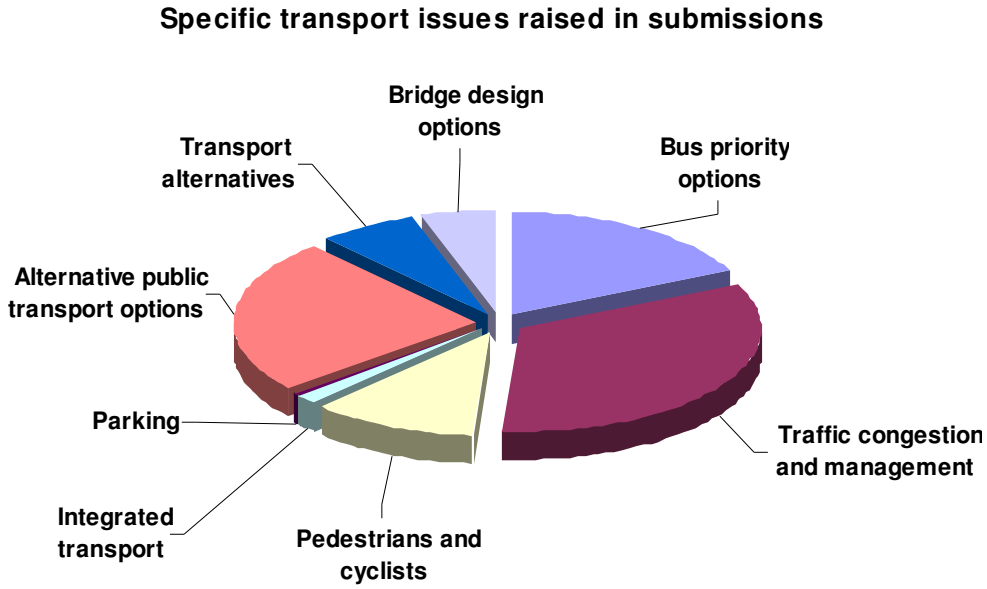
- notes and supports the proposal to introduce a priority cycle way through Drummoyne and Rozelle to provide a safe and continuous route for cyclists;
- the implications for this project of a potential expansion to the north west along Victoria Road of the proposed CBD Metro should be carefully considered;
- in light of the proposed CBD Metro, there is a need to clarify potential competing objectives given the limited available road space;
- there are opportunities for bus services that will utilise Victoria Road to provide interchange options with the CBD Metro at Rozelle and/or White Bay, when operational, which may have some implications for bus operations to the east of Iron Cove Bridge; and
- investigations are underway into potential changes to the bus network in the Inner West to complement the proposed CBD Metro, the outcome of which will have implications for this project.

Sydney Metro submitted the following transport related issues / comments:

- the absence of any outbound PM peak bus lane, or at least transit lane, is not desirable as forcing buses to share with general traffic will negatively impact bus flows and inhibit buses from rejoining the traffic lane from the proposed outbound bus bays at Toelle Street and Lyons Road;
- the availability of only two general traffic lanes in the outbound direction in the AM peak (apart from the short section of bus lane on Iron Cove Bridge) could potentially jeopardise the free flow of buses en route to take up new inbound peak services;
- with the CBD Metro terminating at Rozelle, it will be essential to maintain priority for buses arriving at Rozelle and departing in the outbound direction at all times; and
- the safety and amenity of the pedestrian environment will become more important at Rozelle as a result of the Rozelle Metro station.

Figure 8 breaks down submissions regarding transport issues, showing which specific aspects are considered high priority issues for the community, as well as councils and state agencies.

Figure 8 – Issues raised in submissions



Consideration of Issues

In response to issues raised in submissions, the Proponent, in the Submissions Report, has provided the following:

- The Proponent will undertake a study of traffic access to and from Victoria Road through Drummoyne and Rozelle. The intent of the study is to gain an understanding of regional traffic movements through local streets. The Proponent would then liaise with councils to identify any measures to encourage traffic to use main roads. Outcomes of the study would be reported and the Proponent would consider any comments from the public.
- The Proponent has confirmed the preferred tidal flow system for Drummoyne. The QMB system, comprising a linked concrete barrier that is moved laterally by a special purpose vehicle to reassign lane travel direction and maintain traffic separation, with a support vehicle used to assist with the lane changing operations, is the preferred system. The system minimises the visual impacts of the project through Drummoyne and also provides a number of safety benefits. The safety benefits of the QMB system would include a substantial reduction in the potential for head-on crashes by providing a physical separation between carriageways. The movable median would also provide a pedestrian barrier where one does not exist at present. This would serve to direct pedestrians to designated crossing points. The QMB system would also require less overhead signage than the other two options, negating the need for full or half carriageway gantries in Drummoyne.
- A stage four road safety audit would be conducted prior to opening the project to traffic.
- In response to concerns regarding the location of the bridge piers and their impact on the rowing course, the proposed location of the new bridge piers has been adjusted. This adjustment would have the effect of minimising the impact on the spans through which the rowing course passes. The impacts associated with the adjustments in location and alignment of the piers is consistent with those described in the environmental assessment.
- The safety of marine users is of primary concern. A Marine Safety Management Plan would be developed through a workshop with a cross section of Iron Cove marine users.
- In addition to the preferred project, the Proponent has been undertaking an ongoing study of pedestrian and cyclist improvements. These will be the subject of a separate assessment and approval. The concept design of these improvements would include providing alternative cycle routes to Victoria Road through Drummoyne and Rozelle and a ramp connecting the new bridge to the Bay Run at Henley Marine Drive in Drummoyne.

The Proponent, in the revised Statement of Commitments, has committed to the following:

- Implementation of all feasible and reasonable design, and mitigation and management measures during construction.
- Property access, and pedestrian and cycle access, will be maintained or alternative arrangements made following consultation.
- The new bridge piers will be configured to match the existing Iron Cove Bridge piers and the centre two spans will be no lower in height than the existing bridge.
- Consultation with Iron Cove waterway users will be undertaken during construction of the new bridge to minimise impacts.
- A regional cycleway will be developed in consultation with relevant stakeholders and assessed under a separate environmental assessment process.
- The operation of Victoria Road will be monitored following completion of the project to identify the need for any further operational refinement to optimise the performance of the project.

In relation to traffic and transport construction impacts, the Department is generally satisfied that these impacts can and will be minimised through the proposed management measures and as a result of a large proportion of the project being undertaken outside peak periods and the immediate Victoria Road corridor. , Notwithstanding, the Department considers that the Proponent should implement further measures to minimise construction impacts, particularly in relation to impacts to local access and water way users.

The Department notes the constrained traffic environment adjoining the project, particularly in relation to parking and access and has recommended a range of conditions to ensure that parking and queuing of construction vehicles on public roads is minimised, and that a parking strategy be developed in consultation with councils, with the aim of minimising the impact of parking losses to businesses, recreational users and the wider community. It is also recommended that the Proponent be required to prepare a traffic management plan to ensure traffic and access controls are implemented to minimise impacts on traffic and the amenity of the surrounding environment.

The construction of the project will, in some circumstances, restrict and disrupt the use of the water way in the proximity of Iron Cove Bridge. Whilst the Department recognises that some of these temporary impacts

can not be avoided, it also recognises the importance of Iron Cove to recreational water users and considers that the Proponent should to the greatest extent possible, minimise construction impacts to these users. Accordingly, the Department has recommended conditions of approval that requires the Proponent consult with Iron Cove users to avoid conflicts with activities and scheduled events, where reasonable and feasible, and to ensure the safety of water users.

The project will create changes to both regional and local operational transport characteristics for both land based and water based users. However, the Department is satisfied that the project will meet its stated transport objectives, improve bus reliability and travel times, improve pedestrian and cyclist facilities and safety, and will not unduly increase broader regional and local traffic levels and impacts. Notwithstanding, the Department considers that the project can be further refined during detailed design to further minimise these changes and associated impacts and that the ongoing performance of the project can be addressed through the recommended operational performance audit to be carried out at 12 months and 5 years after completion of construction.

In relation to local traffic and access, the project will result in a redistribution of traffic and changes to existing traffic levels at the local level. The Department considers that the redistribution of traffic and associated impacts are acceptable within the context of the broader project objectives. Notwithstanding, the performance of these changes will be monitored as part of the recommended operational performance audit. The project will result in the loss of parking and this matter is assessed in the assessment of social and economic impacts, which recommends that the Proponent develop a parking strategy that details compensatory car parking to mitigate the loss of parking during operation.

In relation to Iron Cove users, and in particular rowers, the project will result in changes to the existing environment, which will require some adaptation by users. However, the Department considers that the Proponent has designed the project to minimise these changes and that the changes do not overtly impact water way users. Notwithstanding, the Department has recommended conditions of approval that require the Proponent to minimise changes to the horizontal clearances of the new bridge and to ensure that the operation of a rowing course beneath it, complies with the relevant course standards.

The Ministry of Transport and Sydney Metro have raised concerns regarding the integration of this project with the proposed CBD Metro, including competing transport objectives, the allocation of road space between existing traffic and CBD Metro needs, and the implications for future bus operations and user requirements. The Department considers that the Project is complementary to other transport initiatives including the proposed CBD Metro and would provide independent transport benefits. With the CBD Metro terminating at Rozelle, buses will continue to fulfil a key public transport role in the locality and further afield both in the short and longer term.

The Department also considers that these transport benefits would be enhanced by maximising integration between the projects. In noting the scope of the proposed CBD Metro project and the existing need to enhance bus priority along this strategic bus corridor, the Department considers that integration between the projects and any consequent bus operation review would be best facilitated through the CBD Metro Project. Accordingly, the Director-General's requirements for the CBD Metro project requires the consideration of integrating rail stations with existing and proposed transport infrastructure and facilities and to facilitate efficient mode change. This is to be done in consultation with the Ministry of Transport and the Roads and Traffic Authority.

The Department is satisfied that the revised proposal, the Statement of Commitments, and the Department's recommended conditions of approval, provide the necessary measures for mitigating and managing the impacts of construction and operation transport impacts, whilst ensuring that the project meets its and the Government's transport objectives.

5.2 Contamination

Issues Raised in Environmental Assessment

The nature and extent of existing contamination in the study area is primarily associated with past and present industrial activities, which clustered around the foreshore of Iron Cove. The study area was also identified as being located in an area mapped as Class 4-5 for acid sulfate soils risk (requiring less stringent management).

Exposure to contaminated material can adversely impact human health and may be acute or chronic depending on the type, concentration and duration of exposure to the contaminants. If not properly

contained, treated and/or disposed of, contaminated materials have the potential to have toxic effects on the receiving environment and fauna and adversely impact on water quality.

The Proponent has undertaken an assessment of the impact of the project on areas of potential contamination and acid sulfate soils. The following potential impacts are predicted during construction:

Marine-based construction impacts (sediments of Iron Cove)
- where bored piles are required, spoil extracted and collected at the surface may be contaminated;
- temporary land reclamation works on the Rozelle foreshore would have the potential to disturb sediments when being constructed and removed;
- piling works in Iron Cove have the potential to intercept and expose potential acid sulfate material;
- contaminated material has the potential to come into contact with site workers, posing a human health risk; and
- contaminated material may be released from the worksite, thereby affecting local water bodies and ecological communities.

Land-based construction impacts (soils and groundwater)
- there is potential for contaminants already on site to be intercepted and exposed during construction activities;
- contaminated material exposed by excavation may come into contact with site workers through dust emissions, inhalation or ingestion;
- exposed contaminated material may also be discharged from the site through stormwater into local water bodies, resulting in potential to affect ecological communities;
- the piling activities would likely intercept the groundwater table, which may result in water that has come into contact with contaminated soils being introduced to the groundwater aquifer;
- intercepting the groundwater table may release contaminated groundwater into the excavation or piling sites;
- median works between Hancock Street and Evans Street, Rozelle would have the potential to disturb soil with elevated levels of lead; and
- there is potential for fuels and other hazardous material stored and used on site to be released to the receiving environment.

Issues Raised in Submissions

A small number of submissions from the public raised concerns regarding contamination issues. The key concerns raised in the public submissions were:
- health risk due to the disturbance of the Iron Cove sea bed;
- potential adverse impacts in relation to the aquatic environment in Iron Cove, associated with excavation, construction and the like; and
- construction of a west side bridge will disturb subsurface contaminants both in the park and Iron Cove Bay.

Leichhardt Municipal Council requested that the RTA engage a NSW EPA Accredited Site Auditor to review the Site Environmental Management Plans, and the same areas to be the subject of a Validation Report, and subsequently the subject of a Site Audit Statement. DPI requested that an acid sulfate management plan be prepared prior to construction.

Consideration of Issues

The Proponent has undertaken an appropriate assessment of land based, sediment and groundwater contaminants in the locality. Due to the risk during construction of interaction with potential contaminants in and on the foreshores of Iron Cove, detailed intrusive investigations that focused on this area were carried out. These investigations identified that whilst contaminants were present, soil and sediment levels generally met assessment criteria, and where there were exceedances, they were at levels which could be managed and allow offsite disposal subject to appropriate waste classification. Sampling also identified the presence of potential acid sulfate soils, which would need to be managed during construction.

The Proponent, in the revised Statement of Commitments, has committed to protection of the environment, workers and the public by implementing mitigation and management measures pertaining to displaced contaminated sediment or acid sulfate soils, including the incorporation of relevant legislation and policy, , including the RTA's *Contaminated Land Management Guidelines* and *Guidelines for the Management of Acid Sulfate Materials*, *SEPP 55 – Remediation of Land,* and the *Contaminated Land Management Act 1997.*

The Department is of the opinion that such measures would contribute to the safe handling and management of any contaminated materials and thus reduce the likelihood of adverse health and environmental impacts and considers that remediation is not required. Based on the low risk associated with contaminants, the Department agrees that management of this matter can be suitably undertaken by an environmental representative, to be approved by the Director-General.

Notwithstanding, the Department does have concerns regarding the reuse of excavated soils or sediments that contain contaminants, particularly those with contaminant levels above applicable criteria. Accordingly, the Department has recommended, that should this be the case, a Site Audit Statement must be prepared by an accredited Site Auditor that specifies that the material is suitable for the intended final land use.

The Department has also recommended conditions of approval to protect the receiving physical and human environment, including requirements to mitigate the potential impacts of hazardous spills, and disturbance to acid sulfate soils and contaminated soils. These include the management of acid sulphate soils in accordance with the Acid Sulfate Soil Manual, the installation of erosion and sedimentation controls, and the installation of sediment booms and silt curtains.

Based on the proposed management measures, legislative requirements and the Department's recommended conditions of approval, the Department considers that construction of the project would not compromise human health or the environment and there would be no long term contamination impacts.

5.3 Noise and Vibration

Issues Raised in Environmental Assessment

The acoustic environment of Victoria Road is generally dominated by road traffic noise. Sensitive receivers located in the project corridor include residents, schools, places of worship, and parks and recreation areas. Along the route in all zones of the works there are residential properties facing Victoria Road, typically with a façade set back between four and six metres from the near side kerb of Victoria Road.

Receivers near the bridge abutments are considered in four groups:

- Group A – high rise apartment block (Birkenhead Quays) on the eastern side of the northern abutment of the bridge, occupying Cary Street.
- Group B – a large high rise apartment block on Warayama Place (Balmain Shores) near the southern abutment east of the bridge.
- Group C – a group of varied residential properties on Byrnes Street in Rozelle.
- Group D – a group of residences on Formosa Street and facing Victoria Road in Drummoyne.

Construction Noise Impacts – Road Works

The potential for noise impacts comes from two distinct sets of activities, road works and bridge works. Project specific noise goals have been developed for the project after considering existing background noise levels and receiving residences. The goals are based on the rated background limit plus 5 dBA for all times. Table 2 identifies construction noise goals.

Table 2 – Construction noise goals

Location	Daytime, L_{A10} dBA	Evening, L_{A10} dBA	Night, L_{A10} dBA
For residences facing Victoria Road, facades within 10m of kerb	71	67	50
Other residences near Victoria Road	66	62	45

Road work would involve a number of short-term transient activities at specific locations along the project corridor, which would be carried out mainly during the night. The main noise generating road work activities that would occur at various locations along the project route are removal / replacement of median and re-paving. The median works are proposed to be done in 100 metre segments which are expected to take 20 working days for each segment. Paving is expected to be done at a rate of 750 metres^2 per shift. This correlates to approximately 35 metres of road per night averaged over the project.

It is predicted that noise from median works would exceed the criterion at houses along Victoria Road. Predicted noise levels from road works are shown in Table 3.

Table 3 – Predicted noise levels from road works

Location	Median Works		Paving Works	
	Typical maximum level L_{A10} dBA	Days when noise levels may exceed goals (approximately)	Typical maximum level L_{A10} dBA	Days when noise levels may exceed goals (approximately)
For residences facing Victoria Road, facades within 20m of kerb	86	90 days	85	12 days
At other residences near Victoria Road	70-80	30 days	69-79	5 days

Construction Noise Impacts – Bridge Works

The bridge works would occur over the duration of the project (approximately 24 months) and be undertaken largely during daytime hours. Some noise impacts, such as delivery of bulk materials or oversize elements, would be expected outside of standard working hours.

The greatest potential for noise impact associated with the bridge works would occur during construction of the abutments and piers on and adjacent to the foreshore. Construction at these locations would be about 80 metres from the nearest residences and immediately adjacent to The Cove at Drummoyne café.

The predicted noise levels at residential groups A to D are presented in Table 4. The table shows that noise levels of daytime construction work at the bridge would meet the noise goals at residential receivers with the exception of possible minor exceedences (up to 4 dBA) when driven piling is conducted at the closest point to residences.

Table 4 – Predicted noise levels from bridge construction – standard construction hours

Location	Distance (metres)	Shielding (dBA)	Bored piling – range of noise levels L_{A10} dBA	Driven piling – range of noise levels L_{A10} dBA	Structural work – range of noise levels L_{A10} dBA	Daytime goal L_{A10} dBA
A & B	130	5-10	55-60	50-70	47-52	66
C & D	150	5-10	54-59	49-69	46-51	66

Activities that could take place during non-standard construction hours include steel fixing and possibly other similar quiet activities. Noise from steel fixing is predicted to meet the noise goal at all residences.

Compound Site Impacts

The King George Park site would provide the primary compound location for both bridge works and road works. The most significant noise impacts would be related to the demolition phase and heavy vehicle movement, which is expected to take up to 3 months and typically occur between 8pm and 9pm and at approximately 4.30am. Exceedences of noise goals are expected, although exceedances of sleep disturbance goals are smaller. Predicted noise levels from King George Park Compound are shown in Table 5. These levels can be mitigated by at least 5dBA by the use of hoarding around the compound.

Table 5 – Predicted noise levels from King George Park compound – vehicles returning at end of shift

Location	Noise level, $L_{A10,\ 15min}$ dBA	Noise goal $L_{A10,\ 15\ min}$ dBA	Noise level, $L_{A1,\ 1min}$ dBA	Noise goal $L_{A1,1min}$ dBA
272 Victoria Road	55-60	50	61-66	60
Byrnes Street residences	50-58	45	56-64	55

Balmain Shores apartments	49-54	50	54-60	60

Impacts at other compounds include:

- the proposed compound location at the former Carrier site is located on a residential street with potential for impacts to Terry Street and Wulumay Close residences from the movement of heavy vehicles to and from the site; and
- the proposed compound beneath the Gladesville Bridge, which would require access via local roads, would result in noise impacts for residences on Drummoyne Avenue and Victoria Place.

Construction Vibration Impacts

Table 6 identifies vibration guidelines to avoid building damage, as suggested by the German Standard DIN 4150.

The vibration experienced at any structure along the route would depend on many factors. The soil and rock stratum between the vibratory source and the structure plays a major part in vibration transmission. Vibration transmission cannot be predicted accurately until the characteristics of the specific locations have been tested. Notwithstanding, there are several heritage listed items, including the abutments of the previous bridge over Iron Cove, and along Victoria Road that maybe affected by construction vibration. In particular vibration from vibratory rollers during start up and when coming to rest may exceed applicable building damage levels as cited in Table 6.

Table 6 – Vibration guidelines to avoid building damage

Type of Structure	**Guideline values for velocity in mm/s**			
	Vibration at the foundation at a frequency of			**Vibration at horizontal**
	1Hz to 10Hz	**10Hz to 50Hz**	**50Hz to 100Hz (and frequencies above 100Hz)**	**plane of highest floor at all frequencies**
Commercial and industrial	20	20-40	40-50	40
Dwellings	5	5-15	15-20	15
Heritage and other sensitive structures	3	3-8	8-10	8

Safe working limits from buildings would be determined by testing vibration transmission characteristics of the soil and rock stratum where necessary.

Operational Impacts – Upgrade of Victoria Road

The road works (excluding the bridge works) proposed for the project have been described as being of a minor nature, as the project would not move traffic closer to sensitive receivers or increase traffic volumes or change traffic mix that would result in a perceptible change in noise levels. Accordingly, specific noise criteria under the NSW Government's *Environmental Criteria for Road Traffic Noise* (ECRTN) are not applicable to the receivers along Victoria Road.

The Proponent's Submissions Report identified that the Quickchange Moveable Barrier (QMB) system is the preferred tidal flow system, which comprises a linked concrete barrier that is moved laterally by a special purpose vehicle. The most potential for noise impact would be while the transfer is taking place and the vehicle moves slowly past houses when background sound is lowest. The predicted noise level of the QMB pass by at 16kmph is $L_{AEq,\ 15min}$ 58 dBA. As this is less than 5 dBA above the L_{A90}, no noise impact is predicted from this source. The L_{A1} would be 75 dBA, which is equal to the existing L_{A1} noise level.

Operational Impacts – Proposed Bridge

The potential impact on receivers exposed to noise from the proposed bridge has been assessed against the ECRTN 'redevelopment' criteria described in Table 7.

Table 7 – ECRTN Criteria for operational traffic noise – residences

Type of development	Noise level criterion		Where criteria are already exceeded
	Daytime (7.00am – 10.00pm)	Night time (10.00pm – 7.00am)	
Redevelopment of existing freeway / arterial road	$L_{aeq, 15hr}$ 60 dBA	$L_{aeq, 9hr}$ 55 dBA	In all cases, the redevelopment should be designed so as not to increase existing noise levels by more than 2 dBA.

Where the applicable ECRTN criteria are already exceeded, the RTA considers it reasonable to examine treatment opportunities where the project would result in a greater than 2 dBA increase (for redevelopment) 10 years after project opening or where receivers are categorised as noise affected with predicted levels greater than or equal to $L_{aeq, 15hr}$ 65 dBA or $L_{aeq, 9hr}$ 60 dBA.

The noise assessment predicted potentially affected residences near the bridge abutments, King George Park, the Drummoyne Swim Centre and The Cove at Drummoyne café, and are as follows:

- in general, the proposed bridge would result in negligible change to traffic noise exposure for Groups A and B on the eastern side of Iron Cove Bridge, with predicted daytime $L_{Aeq, 15hr}$ dBA and night time $L_{Aeq, 9hr}$ dBA noise change between 0-1 dBA; and
- on the western side of the existing bridge, the alignment of the proposed bridge would transfer traffic noise closer to residences in groups C and D:
    - at Group C, existing noise levels would exceed the $L_{AEq, 15hr}$ 60 dBA daytime criterion. The predicted increase in noise as a result of the project at these residences would be less than 2 dBA, which is within the 2 dBA increase allowed by the ECRTN; and
    - at Group D, noise would increase about 2.5 dBA at 10 Formosa Street, with minor change for other residences in this group. Noise exposure at 10 Formosa Street is also above $L_{Aeq, 15h}$ 65 dBA and $L_{Aeq, 9hr}$ 60 dBA.

Issues Raised in Submissions

A small number of submissions from the public raised concerns regarding noise issues. The key concerns raised in the public submissions were:

- concern about construction noise, particularly night works and bridge works;
- already intolerable noise will increase; and
- new bridge will increase operational noise.

Leichhardt Municipal Council requested that a more comprehensive acoustic assessment be undertaken to identify noise control measures that are required to bring Victoria Road into compliance with the noise levels recommended in the NSW EPAs Environmental Noise Control Manual. Council considers the environmental assessment failed to adequately address the construction and operation noise impacts of the project.

City of Canada Bay Council submitted that the proposal indicates that the noise levels are already above the recommended maximums for community amenity and will be increased over time.

Department of Environment and Climate Change raised the following issues:

- Environmental Criteria for Road Traffic Noise (ECRTN) should apply to the whole road corridor, not just the bridge component. DECC considered that the entire extent of the proposed works were 'redevelopment' because they would result in the provision of bus only lanes, which would change the traffic mix;
- DECC suggested that the project presented an opportunity to address existing acute impacts experienced by residential receivers surrounding the existing Iron Cove Bridge;
- DECC suggested that respite and construction noise impacts could be addressed in a similar way to, for example, the way it was regulated at the Lane Cove River cut and cover for the Epping to Chatswood rail link;
- commitments to implement all feasible and reasonable operational noise mitigation measures should be made including those 'in accordance with the RTA's Environmental Noise Management Manual'; and
- further justification is required regarding the suitability of open graded asphalt.

Consideration of Issues

Construction Impacts
The Proponent, in the revised Statement of Commitments, has committed to minimising construction noise and vibration impacts. All feasible and reasonable mitigation and management measures (potentially including respite periods or temporary attenuation), to minimise construction noise at sensitive receivers will be investigated. Mitigation measures will be in line with the RTA's *Environmental Noise Management Manual.*

The Department notes the need to undertake a range of out of hours activities for road and bridge works to minimise transport impacts along Victoria Road during peak periods and considers that construction noise impacts for this project are best managed at an activity level focusing on those areas and receivers likely to be most affected. The Department also notes that whilst there will be construction noise exceedances, construction works along Victoria Road will be transient as the works progress. Consequently, the Department has recommended that 24 hour construction be permitted subject to strict criteria, including that all construction activities to be undertaken before 07:00 or after 18:00 on any day, or on a weekend or public holiday at any time, shall be subject to detailed noise mitigation, monitoring and management measures specified in an approved Construction Noise and Vibration Management Plan.

Construction noise impacts at work compounds, and in particular the King George Park compound has the potential to affect the noise amenity of adjoining residences, particularly during the demolition phase. Whilst the Department notes that predicted noise levels are similar to existing traffic noise levels, it supports the Proponents commitment for temporary hoarding (barriers) to reduce impacts.

With respect to The Cove at Drummoyne café, where stationary construction noise impacts are expected, the Department supports the Proponent's commitment to address construction noise and related property and amenity impacts to the café, which includes the construction of a new covered deck on the southern (rear) side of the building, enclosure of exterior areas and the installation of air conditioning, and has recommended a condition of approval that reinforces the Proponent's commitment to assist in securing development consent and works to mitigate associated impacts.

The Department notes that further vibration testing and monitoring is required to ensure safe working distances and construction methodology is achieved in order to protect adjoining structures. The Department supports this approach and has reinforced this measure in the recommended conditions of approval. The Project must also be constructed so that impacts to property is minimised and that any damage be rectified by the Proponent.

Based on the Proponent's proposed management and mitigation measures, the requirements as set out in the RTA's *Environmental Noise Management Manual* and the Department's recommended conditions of approval, the Department considers that the project would be constructed within acceptable acoustic and vibration limits.

Operational Impacts
In response to the above issues raised, the Proponent, in the Submissions Report, provided the following:

- Regarding application of the ECRTN, the Proponent has provided DECC with additional information which shows that the change in traffic mix would be imperceptible. Having considered this information, DECC agrees that the road work component of the project is appropriately considered to be of a minor nature under the ECRTN.
- Properties subject to analysis under the road redevelopment definition include those fronting Victoria Road between Clubb Street and Byrnes Street, those fronting Byrnes Street between Victoria Road and Manning Street, and those bordered by Victoria Road, Park Avenue, Formosa Street and Henley Marine Drive. Properties along the sections of Victoria Road where only minor works are proposed would not be exposed to new noise impacts and no mitigation measures would be provided for businesses or residential receivers.
- Open grade asphalt is considered unsuitable in stop start traffic conditions. It is also considered to have minimal affect on road traffic noise levels where vehicle speeds are low.
- While the environmental assessment for the project included a detailed noise and vibration study, in response to issues raised in submissions, the Proponent is committed to undertaking further noise assessment.

The Proponent, in the revised Statement of Commitments, has committed to minimising operational noise and vibration impacts, whereby noise affected residents already experiencing noise levels above the criteria

will be considered for reasonable and feasible mitigation in consultation with affected property owners. Operational noise will be monitored within one year after construction is finalised, and any additional mitigation measures will be developed in consultation with a suitably qualified and experienced acoustic specialist and the affected property owner. All measures proposed will be in accordance with the NSW Government's *Environmental Criteria for Road Traffic Noise* and the RTA's *Environmental Noise Management Manual.*

The Department is satisfied with the noise assessment undertaken by the Proponent and that the relevant guidelines and criteria have been considered. The Department considers that the operational noise impacts of the project will be minimal and supports the Proponents commitment to investigate the provision of noise mitigation measures to those properties within the vicinity of Iron Cove that currently have noise exceedances . Notwithstanding, the Department has recommended a condition to reinforce the Proponent's commitment in relation to existing noise exceedances. The ongoing acoustic performance of the project will also be addressed through the recommended operational performance audit, which is to be carried out at 12 months and 5 years after completion of construction.

Therefore, based on the Proponent's proposed management and mitigation measures and the Department's recommended conditions of approval, the Department considers that the project would be operated within acceptable acoustic limits.

5.4 Visual Amenity and Urban Design

Issues Raised in Environmental Assessment

Urban design objectives

The urban design objectives for the project were established during the early stages of project development and revised during concept design development. The objectives guided the project development to ensure that the urban design and visual amenity of the Victoria Road corridor is enhanced and that the project would be consistent with the existing and desired future character of the area.

Objective 1: Iron Cove Crossing

- To provide a new Iron Cove crossing of aesthetic value that complements the existing bridge and that acknowledges the unique beauty of Iron Cove and Sydney Harbour.

Objective 2: Unified and consistent design.

- To provide a consistent and unified design for the project that integrates with the existing urban and landscape characteristics of the area.

Objective 3: Pedestrian, disabled person and cyclist amenity

- To enhance the function and amenity of pedestrian, disabled and cyclist facilities and connectivity at the Iron Cove crossing, and to maintain the functions of the footpaths, cycle ways and crossings of Victoria Road.

Objective 4: Respect communities and cultural sites

- To respect the communities, built forms, landscape and culturally sensitive sites along Victoria Road.

Objective 5: Minimise impacts on the public domain

- To minimise impacts on the public domain, especially at public open spaces, and at Iron Cove / Sydney Harbour during construction and operation.

Drummoyne and Rozelle

During construction, the visual impacts of road work in Drummoyne and Rozelle would be limited to the installation of temporary facilities and construction sites and compounds. The roadwork and other compounds along the corridor would have a medium to high impact in the short-term, but the long-term visual impact following site restoration would be very low.

The design elements of the project in Drummoyne and Rozelle are considered to be similar in visual character. The visual catchment along Victoria Road in Drummoyne and Rozelle would experience permanent visual changes from certain features of the project such as partial road resurfacing, installation of pedestrian fencing, modified medians, re-configured bus stops, landscaping, installation of overhead signage structures, and traffic signal changes. The upgrade would also introduce a number of visually positive elements including consistent design and road furniture.

The Washington palm trees in the Rozelle median would need to be relocated to accommodate changes to the median. The visual effect of this relocation was assessed to be high due to the prominence of the trees in the visual catchment. Overall, the completed project in Drummoyne and Rozelle would have a low visual impact as most of the road works would be limited to the carriageway areas.

Iron Cove Bridge

The visual impacts of the construction of the new bridge would be associated with the construction activities and associated equipment in general and compound sites. Two major construction compounds are proposed at the bridge abutments: one at Henley Marine Drive adjacent to the bridge and Drummoyne Swim Centre, and the second in the eastern portion of King George Park to accommodate the major bridge works compound activities.The construction of the bridge would introduce some temporary large construction activities and machinery into the visual catchment including barges, cranes and gantries.

The new bridge over Iron Cove would be a new and prominent feature in Iron Cove. The affected receivers for the purposes of visual amenity include residential, commercial, recreational water users, pedestrians and cyclists. The new bridge has been designed to minimise impacts on the existing bridge, yet provide a new crossing of aesthetic value.

The visual effect of the new bridge would be highly dependent on the receiver's perspective as the size of the bridge in the visual landscape would be significantly affected by distance. Residences at the point at Sisters Bay would experience a medium to high visual effect due to the proximity and prominence of the bridge. From local viewpoints, including the Drummoyne Swim Centre, The Cove at Drummoyne café and King George Park, the visual sensitivity would be high.

The new bridge would also add to the shadow effect in the early mornings to the western side of the new bridge, in particular this would affect the Drummoyne Swim Centre, the lookout area at the northern and southern abutments, portions of Henley Marine Drive, portions of the Bay Run, portions of King George Park, and waterway areas. The large Moreton Bay fig tree on the western side of the northern Iron Cove Bridge abutment would need to be pruned to accommodate the new bridge. The visual effect was assessed to be high due to the prominent location of the tree.

Overall, the bridge would have a high visual impact from locations close to the new bridge and for users of the bridge, and low to very low from more distant perspectives.

Issues Raised in Submissions

A number of submissions from the public raised concerns regarding visual amenity and urban design issues. The key concerns raised in the public submissions were:

Iron Cove Bridge

- instead of building a new bridge, retain the clip-on lane and add an extra fourth lane to the bridge as an extra bus or general traffic lane;
- instead of building a new bridge, clip on an extra lane for cyclists / pedestrians as a cheaper option, freeing up an existing lane for bus use;
- instead of building a new bridge, build a separate cyclists / pedestrian bridge;
- the second bridge is considered to be a 'monstrosity', 'visual pollution', an 'eyesore';
- the additional bridge would have a significant negative impact on visual amenity, particularly at King George Park, Callan Park and the Drummoyne Pool; and
- the new bridge would overshadow Drummoyne Pool and the existing lookout on the southern sandstone abutment, and result in a loss of amenity.

Drummoyne and Rozelle

- objects to the removal of the trees from the median in Rozelle;
- the redirective medians proposed would have a high visual impact; and
- the proposed signage gantry over Victoria Road is considered to be visually bulky and have additional adverse amenity impacts.

Leichhardt Municipal Council raised the following issues:

- recommends the preparation of an urban design strategy to use road and pavement treatments to reduce noise, use landscaping and street furniture to mitigate the effects of air pollution and noise, particularly at major intersections, enhance the appearance of the streetscape using hard and soft landscaping elements; and
- recommends the preparation of a materials palette identifying features that would contribute to the enhancement of the streetscape in accordance with the Urban Design Strategy.

City of Canada Bay Council submitted that the proposed bridge would overshadow the Drummoyne Pool and The Cove at Drummmoyne café, and by being significantly closer would bring more disruption through noise, vibration, air pollution and reduced visual amenity.

Consideration of Issues

The Proponent, in the Submissions Report, addressed the urban design objectives as follows:

Objective 1: Iron Cove Crossing

- To achieve this objective a number of urban design bridge principles were developed with regards to the RTA's *'Bridge Aesthetics – Design Guidelines to improve the appearance of bridges in NSW 2003'*.

Objective 2: Unified and consistent design.

- An urban and landscape concept design has been prepared which is consistent with the urban and landscape design objectives of the project. A proposed palette of colours and finishes has also been developed. In finalising the concept, the RTA would consult with both Leichhardt and City of Canada Bay councils.

Objective 3: Pedestrian, disabled person and cyclist amenity

- The moveable median in Drummoyne and the additional pedestrian fencing in Rozelle would provide a pedestrian barrier in areas where one does not exist at the moment, providing improved pedestrian safety. The project would also provide new crossing points at Day Street and Park Avenue in Drummoyne, further improving the amenity and safety for pedestrians.

Objective 4: Respect communities and cultural sites

- To minimise impacts to the 'International Day of Mourning' memorial, it is proposed that it would be relocated to a suitable position within King George Park in consultation with the Construction Forestry Mining Energy Union, Leichhardt Municipal Council and other relevant stakeholders.
- Where direct impact to the original sandstone abutment wall is necessary, the abutment would be temporarily dismantled and reinstated following completion of the works to as close to preconstruction conditions as possible.

Objective 5: Minimise impacts on the public domain

- The possible relocation of the 23 palm trees in the existing median in the Rozelle section, would be discussed with stakeholders.
- The impact of overshadowing of the existing lookout on the southern sandstone abutment would be considered during the planning for the rehabilitation of the area to determine if there are any strategies that can be adopted to minimise the overshadowing impact on the abutment.

The Department is generally satisfied that the Proponent has identified a range of design and landscape solutions that will assist towards mitigating construction and operational design, visual and landscaping and open space impacts. In particular, the Proponent in its revised Statement of Commitments, has committed to:

- mitigating residual impacts in accordance with the visual and urban design objectives for the project;
- use robust, long-lasting, replaceable and easy to maintain materials and designs for built elements;
- use predominantly endemic species that will be self sustaining for landscaping; and
- consult with Leichhardt City Council, the community and other relevant stakeholders with regards to the relocation of the Washington palm trees, and relocation and improvements to the playground in King George Park.

Whilst the Department acknowledges that the new bridge will introduce a significant visual element into the existing environment, it also considers that this impact is highly subjective and that the Proponent has attempted, through consultation and design, to minimise the visual presence of the bridge. The Department also notes that the bridge will have some residual impacts, such as overshadowing. Whilst this is not a desirable outcome, the Department does not consider this will unduly affect associated recreational areas or facilities and should not preclude the project from proceeding.

The Department considers that the finalisation of the urban and landscape design in consultation with councils will also ensure that local considerations and council strategies are suitably integrated into the final urban design solutions and reflect local values.

Notwithstanding, the Department recognises that further improvements to the design and landscaping of the project can be undertaken to further mitigate impacts. To reflect this, the Department has recommended conditions of approval that require the Proponent to minimise visual impacts of infrastructure and hard landscaping elements, such as overhead structures and to prepare an Urban Design and Landscaping Plan, to be approved by the Director-General. The Plan is to provide an integrated urban design for the project

and provide for the ongoing rehabilitation and management of affected areas. The Department has also recommended a condition that requires the Proponent to prepare a Heritage Management Plan, which will ensure that impacts to heritage items such as the War Memorial in King George Park are minimised and managed.

Based on the revised proposal, the Proponent's proposed management and mitigation measures, and the Department's recommended conditions of approval, the Department considers that the project can be designed and constructed so as not to have significant impacts on the visual amenity and landscape of the locality. The residual impacts associated with the project are considered acceptable when compared to the overall benefits the project will achieve.

5.5 Social and Economic

Issues Raised in Environmental Assessment

The study area contains numerous land uses and built forms, including former industrial sites, a range of low-density and medium-density housing, historic commercial and retail premises, and port and boating facilities.

The following potential social and economic impacts are predicted during construction and also operation of the project:

Business viability and sustainability

- a major potential influence on business viability and sustainability would be the proposed loss of approximately 50 car parking spaces on Victoria Road, Drummoyne due to AM and PM clearways;
- the rationalisation of bus stops could reduce customer access, which could impact businesses adjacent to the stops being relocated;
- Drummoyne Swim Centre and The Cove at Drummoyne café would experience a temporary loss of 37 off-street car spaces during construction due to the location of the construction compound, and twelve spaces would remain unavailable following completion of the project due to the location of the new bridge abutment; and
- during the two year construction period the Drummoyne café would be affected by a lessening of visual outlook and increased noise, and due to the proposed new bridge the visual outlook from the café would be permanently altered.

Property and land use

- the composition of commercial zones may change if businesses choose to relocate in response to the project, although this is not expected to reduce the overall level of business and retail services to the local communities;
- overall, the Drummoyne retail strip would remain sustainable, despite the proposed changes to parking, as it is considered that there would be sufficient businesses with a desire to locate to the area;
- the project would have a minor potential to encourage future residential and commercial development as a result of improved public transport accessibility along the corridor; and
- no private property acquisition would be required.

Transport

- community consultation during project development identified that motorists have the following concerns in relation to the project: local traffic movements, congestion, use of transit lanes, parking, and street signage;
- issues raised by bus passengers include: the need for more frequent services, the need for increased reliability and travel time, bus overcrowding, consistency of trip times, service reliability, and quality of service in general;
- in relation to transport, the project would have the following social and economic impacts:
    - — there would be more consistent bus operations;
    - — predicted reduction in trip times would encourage people to use bus travel for comuting to work;
    - — rationalisation of bus stops may increase the walking distance for some people by between 150 and 200 metres and reduce walking distances for others;
    - — provision of additional lane space at key intersections would provide increased accessibility to areas adjacent to the study area for motorists and buses; and

— removal of the right-hand turns for outbound traffic from Victoria Road into Evans Street and citybound traffic from Victoria Road into Gordon Street would reduce access to these local areas but improve traffic flows along this section.

Residential amenity

- during construction, a number of construction and compound sites are proposed throughout the project corridor, which would result in temporary residential amenity impacts; and
- once the project is operational it would have negligible social impact on residences immediately adjoining the project corridor, a small number of properties would be marginally affected by an increase in noise in the vicinity of Iron Cove, and a small number of residents would experience a reduction in available on-street parking.

Recreation

- construction of the project would have a number of impacts on open space areas, including impacts on pedestrian and cycle access along the foreshore, temporary reduction in open space at King George Park, and minor restrictions on access to the Iron Cove waterway; and
- operation of the project would have a number of impacts on open space areas, including longer walking path beneath the bridges, some open views out to Iron Cove impeded by new bridge piers, additional shading of the Drummoyne Swim Centre pool, and less open space in King George Park.

Pedestrians and cyclists

- construction of the project would have a number of impacts on pedestrians and cyclists, including impact on access to the Bay Run as a result of bridge construction activities, and impacts from works associated with the installation of project elements which may affect pedestrians using footpaths; and
- design of the project would include provision of safer cycling and pedestrian facilities.

Issues Raised in Submissions

A significant number of submissions from the public raised concerns regarding social and economic issues. The key concerns raised in public submissions were:

Business viability and sustainability

- what consideration and compensation will be made towards established businesses that will be affected by this project?
- tidal flow parking restrictions will hasten the demise of businesses along Victoria Rd;
- the construction of a new bridge will greatly impact the future and result in a loss of further membership of the Dobroyd Aquatic Club; and
- expansion of the existing outbound AM clearway will be difficult for shops in Drummoyne, as trucks and large vehicles stop to shop here in the AM peak.

Open space and land use

- loss of space in King George Park, which is an important local recreation and public open space area, linking in with Callan Park and the Bay Run;
- only the minimum amount of parkland should be permitted to be used for construction site purposes, and no existing parkland should be used, temporarily or permanently, for the purpose of parking motor vehicles; and
- loss of some land in Brett Park for car parking.

The key concerns raised in the public submission form letters were:

- construction zone environmental degradation is unjustifiable including the annexation of King George Park as a construction site impacting on park use and the Bay Run;
- the new bridge will permanently destroy a large area of King George Park, and compromise the very popular Bay Run;
- the new Bridge will result in the closure of a children's playground, and it's relocation has not been defined; and
- on the northern side, the new bridge will overshadow Drummoyne Pool, used by over 50 schools, and thousands of local residents, and impinge on the nearby fig tree.

Pedestrian and Cyclist Access

- a ramp should be provided on the Drummoyne side of the bridge to provide a direct pedestrian and cycle link to the 'Bay Run'; and
- an opportunity exists to address the lack of pedestrian crossing facilities in Henley Marine Drive in the vicinity of Formosa Street, Drummoyne for pedestrians and cyclists using the Bay Run.

Rowing community
- disruption of the sailing course during the construction period;
- the long term reduction of sailing courses and changes to wind flows in the northern end of Iron Cove; and
- safety for rowers, which may be affected by the design of the new bridge, as the bridge pylons may render the Iron Cove course unsafe to navigate.

Project Justification
- a significant number of submissions raised objection to the project on the basis of cost, stating the project to be 'a waste of money' or 'not economically viable'.

The key concerns raised in the public submission form letters were:
- as NSW is in financial difficulty, it is unwise to press on with this project;
- the cost/benefit analysis that has been undertaken reportedly shows this project to have greater costs than benefits;
- this project started off at $60M, and has already escalated to $165M; and
- benefits claimed by the RTA are vague, unsupported and have varied between RTA statements whilst costs in terms of impact on the environment and community amenities are disregarded or not provided adequate weight.

Leichhardt Municipal Council has submitted that they will not enter into a lease with the RTA for the use of King George Park or Bridgewater Park and that further legal advice is currently being sought.

The Ministry of Transport notes and supports the proposal to introduce a priority cycle way through Drummoyne and Rozelle to provide a safe and continuous route for cyclists.

The Sydney Metro submission raised the issue that the safety and amenity of the pedestrian environment will become more important at Rozelle as a result of the Rozelle Metro station.

Consideration of Issues
Overall, the Department is satisfied that the Proponent has designed the project to minimise social and economic impacts and has provided a sufficient framework to limit the construction related impacts of the project. The Department also considers that the project will deliver social and economic improvements by improving public transport, cycle and pedestrian accessibility, whilst minimising impacts associated with regional and local traffic flows.

The Proponent, in the Submissions Report, in responding to a number of concerns identified the following actions, building on those identified in the Environmental Assessment:
- the project would include the restoration of King George Park, which would be undertaken in consultation with Leichhardt Municipal Council and the community;
- the design and location of the new playground would be determined in consultation with Leichhardt Municipal Council and the community; and
- investigations have determined that a car park situated in a section of Brett Park at the intersection of Henley Marine Drive and Formosa Street would, on balance, best reduce the impact of construction of the project on parking near Iron Cove Bridge in Drummoyne.

The Proponent, in its revised Statement of Commitments, has committed to a range of mitigation measures to minimise the impacts of the project on surrounding land uses, properties, land owners and residents. These measures include:
- investigation into opportunities to modify existing parking arrangements to minimise the loss of parking during construction and operation of the project;
- managing occupation and use of compounds and work sites, to minimise disturbance to adjacent residents; and
- funding for The Cove Café at Drummoyne to minimise the affect of amenity impacts on the operation of the café.

Notwithstanding, the Department recognises that further work will need to be undertaken by the Proponent to ensure impacts are managed and has recommended a range of conditions to reflect this. In relation to business viability and sustainability, the Department notes that there will be both temporary and permanent access changes, particularly in relation to the loss of on street car parking as a result of changed traffic conditions. Parking along Victoria Road and surrounds is limited and subject to various time and spatial

restrictions and the greatest impact to parking and consequently on businesses would be at Drummoyne as a result of parking clearway restrictions in both the AM and PM peak. This impact is difficult to quantify and is relative to the type of business and the proximity of alternate parking. However, the Department notes that parking surveys have identified that existing parking is not fully utilised and that there are commensurate levels of car parking available on adjoining streets.

In order to address parking impacts, the Department recommended a condition requiring the Proponent prepare Parking Strategy to address car parking and access arrangements during construction and operation, with the aim of minimising and managing the loss of parking, which in turn will minimise impacts to business viability and sustainability. In relation to other access changes, such as relocation of bus stops, the Department considers that these will be minimal, will not have a significant impact, and will in some circumstances improve access. Other land and water based transport matters have been addressed in section 5.1.

In relation to open space, landscaping and land use impacts, and as previously noted, the Department supports the Proponent's committment to minimising these impacts and that residual impacts can generally be mitigated through standard management measures and through the proposed Urban Design and Landscape Plan, which requires the restoration of public space impacts. The Department has also recommended conditions of approval that require maintenance of safe pedestrian and cyclist access during construction, measures for establishment and management of construction site compounds to ensure minimal impact to the surrounding land uses, and consultation with Leichhardt Municipal Council regarding the use of King George Park during construction. Matters relating to project justification have been addressed in section 2.2.

The Department also recommends that the Proponent be required to prepare a Community Communication Strategy to ensure the community is kept up to date with construction activities and any changes to the scope of the works. Based on these measures, the Department considers that the project would not have unmanageable adverse social or economic impacts.

5.6 Non-Aboriginal Heritage

Issues Raised in Environmental Assessment

Non-Aboriginal settlement in the Drummoyne and Rozelle areas can be traced back to the 1800s. A number of non-Aboriginal heritage items were identified within the study area. Statutory and non-statutory heritage registers show there are a number of conservation zones and individually listed items within the study area.

The original Iron Cove Bridge was built to link the suburbs of Balmain and Drummoyne and was opened in 1882. It created a new route to Sydney from the west and provided the impetus for development along the linked roads. The existing bridge was built to replace the original bridge, which was deemed inadequate and eventually demolished. The existing bridge was opened in 1955 and is of State heritage significance.

There are a number of specific items which will be potentially affected by the project. The following potential impacts are predicted during construction:

Drummoyne section

- there is potential for a minor physical impact to the awning of PJ Gallagher's Hotel;
- there would be a potential for impact on unknown archaeological remains that may be present below the current footpath and road surfaces, in particular the western outbound lane and footpath and the central areas of the former road alignment;
- specific equipment such as rock hammers and vibratory rollers would have the potential to damage heritage structures when undertaken in close proximity; and
- there is potential for minor visual impact to heritage items along this section of the corridor.

Iron Cove Bridge section

- construction activities, including excavation and formwork for the proposed piers and abutment locations, would directly impact the remnant sandstone abutment of the 1882 bridge in Rozelle and would be close to the abutment in Drummoyne;
- the existing bridge and its piers would be at risk of minor accidental physical impacts through the movement and use of heavy water-based and land-based equipment;
- there is potential to impact on buried relics in the area such as remnant concrete pavement, tramlines and the remains of the former Leichhardt ferry jetty on the Rozelle foreshore, due to localised piling activities and excavation works for pile caps; and
- there is potential for minor visual impact to heritage items associated with Iron Cove.

Rozelle section

- impacts on unknown archaeological relics would have the potential to occur during construction, particularly along the eastern citybound lane, footpath and existing median of Victoria Road between The Crescent and Iron Cove Bridge;
- there could be a direct impact on remnant areas of sandstone kerbing at Gordon Street, where it is proposed to make adjustments to the kerb;
- specific equipment such as rock hammers and vibratory rollers would have the potential to damage heritage structures when undertaken in close proximity; and
- there is potential for minor visual impact to heritage items along this section of the corridor.

Issues Raised in Submissions

A small number of submissions from the public raised concerns regarding heritage issues. The key concerns raised in the public submissions were:

- considerable adverse visual impact on the existing Iron Cove Bridge (State heritage significance);
- significant adverse impacts in respect of the heritage significance of the remaining sandstone elements of the original bridge over Iron Cove;
- the second bridge destroys the curtilage of the heritage Iron Cove Bridge and has a significant negative impact on the role of the 1882 Iron Cove Bridge as an iconic landmark; and
- the second bridge causes the complete overshadowing of the lookout in King George Park on the original southern sandstone abutment.

Leichhardt Municipal Council supports the recommendations put forward in the archaeological working paper (Appendix L of the Environmental Assessment), however states that it is unclear whether the RTA has endorsed these recommendations. Council requested that the Environmental Assessment undergo a further comprehensive review by the RTA to explore the possibilities of reducing heritage impacts on the 1882 former Iron Cove Bridge sandstone abutments and a new bridge design which does not dominate the appearance of the existing heritage significant Iron Cove Bridge.

Consideration of Issues

The Department considers that the Proponent has adequately designed the project to respect the heritage significance of the existing Iron Cove bridge, and committed to actions that minimise project impacts on heritage items. Whilst the project will have some heritage impacts, the Department supports the Proponent's commitment to preparing site environmental management plans to ensure the impacts on non-Aboriginal heritage items are minimised, and the implementation of a heritage interpretation strategy as part of the final landscaping works. The Department also notes that the Proponent has endorsed the recommendations in the archaeological working paper, which would be incorporated into the construction environmental management plan for the project.

Notwithstanding, the Department has recommended conditions approval to reinforce the Proponent's commitments to ensure protection of heritage items, including the requirement for the preparation of a Heritage Management Plan. This Plan will ensure that work within the vicinity of all known heritage items is undertaken to ensure minimal impact to heritage items, and that appropriate recording of each item is carried out. In particular, the Proponent must ensure that the physical fabric of the Iron Cove Bridge is protected, that impacts to the 1882 sandstone abutments are minimised and that safe public access is reinstated following construction, subject to public safety and security.

Procedures to be implemented if previously unidentified heritage items are discovered during construction are also required and based on these measures the Department considers that the project would not have unmanageable adverse heritage impacts.

5.7 Other Issues

5.7.1 Air Quality

Issues Raised in Environmental Assessment

Air quality in the vicinity of the study area is largely influenced by emissions from motor vehicles travelling on Victoria Road and other local roads.

Dust generation would be the primary potential impact on air quality resulting from construction of the project. The major causes of dust would be excavation, sawing, sweeping, blasting, and wind erosion of exposed surfaces. Dust mobilisation has the potential to create a visual impact, settle on property and

residences and cause general discomfort for the community in the immediate area, as well as project personnel.

It is predicted that there would be only slight differences between the highest operation pollution concentrations with or without the project. In general, operational air quality is not predicted to decline noticeably as a result of the project, and would continue to meet DECC air quality goals.

Issues Raised in Submissions
A small number of submissions from the public raised concerns regarding air pollution issues. The key concerns raised in the public submissions were:

- construction pollution will destroy a significant part of the resident amenity in King George Park;
- two year construction will create dust impacts for surrounding residences;
- new bridge will increase pollution; and
- increase in traffic along Victoria Rd will result in increase air pollution in the local Rozelle community.

Consideration of Issues
The Department considers that the risk of dust impacts during construction can be managed through the implementation of industry best practice and mitigation measures. This has been reflected within the Proponent's revised Statement of Commitments to adopt feasible and reasonable mitigation and management measures to minimise dust and emissions, and reinforced through the Department's recommended conditions of approval.

The RTA undertook an air quality assessment of the project, which determined that operation of the project would not result in a noticeable decline in air quality in the area, and would continue to meet DECC air quality goals. The Department considers that the risk of a noticeable decline in air quality in the area as a result of operation of the project is low and that no further action is required on this matter.

5.7.2 Geology and Soils, and Water

Issues Raised in Environmental Assessment
Generally, the soils in the study area have been heavily modified by a long history of extensive industrial, commercial and residential development. Areas on the foreshore of Iron Cove have been reclaimed and contain imported materials.

During construction, the potential for erosion and sedimentation impact from road works throughout Rozelle and Drummoyne is considered low. Road work activities have the potential to expose unconsolidated subsurface materials which have the potential to move from the site, discharge into the local stormwater system and eventually travel downstream into water bodies such as Iron Cove, Rozelle/White Bay and the Parramatta River. Any erosion potential would be managed through the implementation of appropriate controls and practices.

Construction of a new bridge and associated approaches present a higher level of risk to the water quality of Iron Cove. During the land-based construction works, vegetation would be cleared and minor earthworks would occur to enable construction of the bridge structures and suitable compound areas. Unconsolidated material would be exposed through vegetation clearing, excavation and piling, and minor reclamation on the foreshore. While these activities would present a higher risk of erosion than the road work aspects of the project, the implementation of standard / best practice mitigation measures would be appropriate to manage this risk.

There is also a risk of accidental spills, which may enter Iron Cove either through the local stormwater system or directly from over-water equipment. Above-water work, involving the in-situ casting of bridge components and grouting, would present a moderate risk of material falling into Iron Cove.

Issues Raised in Submissions
None of the submissions received from the public raised concerns regarding the proposal.

The City of Canada Bay raised a concern regarding water pollution, and suggested the RTA should install and maintain gross pollutant traps to trap fine particles from all storm water drains on Victoria Rd.

DPI submitted that appropriate erosion and sediment control measures should be implemented, especially during foreshore construction works, all pile driving or boring activities, and in the construction of the temporary jetty.

NSW Maritime submitted that appropriate conditions should be imposed to mitigate potential environmental impacts to the waterway during construction activities and operation of the roadway.

The DWE submission identified that if not already licensed, a licence is required from DWE for the groundwater monitoring bores. Provision of groundwater level and quality information will be a condition of that licence. DWE supports consultation in the event that adaptive management measures are required.

The DECC submission identified that the project should be undertaken in line with any obligations under the *Protection of the Environment Operations Act 1997*, Section 120 'prohibition of pollution of waters'.

Consideration of Issues

The Department considers that the risk of erosion and sedimentation of waterways during construction can be managed through the implementation of erosion and sedimentation management and control measures. This has been reflected within the Proponent's revised Statement of Commitments, which commits to seeking the advice of a soil conservation scientist and inspecting controls regularly. The Department's recommended conditions of approval also require the Proponent to implement erosion and sediment control measures consistent with *Managing Urban Stormwater: Soils and Construction* (Landcom, 2004), and implementing specific water-based construction management measures.

The Proponent, in the revised Statement of Commitments, has committed to ensuring water quality impacts are minimised during construction through proper bunding of areas used for storage of potentially hazardous and contaminating activities, and by ensuring spills are contained immediately and disposed of appropriately.

The Department considers that the risk of pollution of waterways during construction can effectively be managed and has required compliance with section 120 of the *Protection of the Environment Operations Act 1997* which prohibits the pollution of waters.

5.7.3 Biodiversity

Issues Raised in Environmental Assessment

The study area is located in a highly modified urban environment with scattered vegetation along and surrounding Victoria Road. Biodiversity values are considered to be low, with limited fauna habitat, no bushland reserves, and no suitable habitats to support species listed under the *Fisheries Management Act 1994* or *Environmental Protection and Biodiversity Conservation Act 1999*.

Road works would be confined to the existing Victoria Road footprint. The replacement of the existing median would require the removal of the 23 Washington palms in Rozelle. The trees would be relocated to an appropriate location in consultation with an arboriculture specialist and council representatives. Construction works associated with the bridge approaches would require some vegetation clearing. No threatened species or ecological communities would be affected by this clearing. About 15% of the Moreton Bay fig tree's canopy (located near Drummoyne Swim Centre) would need to be pruned along the alignment of the proposed new bridge. This is unlikely to affect the life of the tree.

During construction there would be potential for direct and indirect impacts on the aquatic ecology of Iron Cove. Temporary reclamation along the foreshore of Iron Cove in Rozelle would impact the riparian biota. Site preparation and piling works on the bed of the cove may result in the direct loss of benthic organisms. This aquatic community is considered to be well represented within the estuary and it is anticipated that the biota would readily colonise the disturbed areas following construction. At no time during construction would fish passage be blocked.

Issues Raised in Submissions

A small number of submissions from the public raised concerns regarding biodiversity issues. The key concerns raised in the public submissions were:

- object to the removal of the Washington palm's from the median strip in Rozelle;
- the new bridge will eradicate birds, ducks, fruit bats, possums, native bush rats, foxes, ancient trees, flora and fauna; and
- potential impacts on the health and longevity of the large Fig Tree adjacent to Drummoyne Swimming Pool.

The DECC submission identified that all feasible and reasonable mitigation and management measures should be implemented to reduce the impacts to aquatic biota and habitat as a result of the proposed bridge construction.

The DWE submission recommended that the proposed mitigation measure to revegetate the foreshore of Iron Cove use appropriate local native riparian vegetation (trees, shrubs and groundcover species) at a density that would occur naturally. DWE recommends the width of the riparian corridor be maximised around the Iron Cove foreshore area.

Consideration of Issues
The Department is satisfied that the Proponent's mitigation measures are adequate to protect biodiversity. The Proponent, in the revised Statement of Commitments, has committed to retaining vegetation where possible, to undertake revegetation and landscaping on the foreshore of Iron Cove, to enhance habitat availability / connectivity, and to investigate opportunities for rehabilitation and enhancement of the in-water areas directly affected by the project.

An arboriculture impact assessment of the project on the Moreton Bay fig tree found there would not be a significant impact on the life expectancy of the tree. The Proponent has committed to engaging a project arborist prior to and for the duration of the project to document, advise and monitor the management of the fig tree. This is also reflected in the Department's recommended conditions of approval.

5.7.4 Aboriginal Heritage

Issues Raised in Environmental Assessment
The study area has been heavily affected by urban development including industry, roads, residential and other urban infrastructure. This has severely impacted Aboriginal sites that would have previously been located in this area. Searches of Aboriginal objects/sites concluded that no objects/sites are located within or immediately adjacent to the study area. No known Aboriginal objects or places would be directly or indirectly affected by the project or the ancillary construction activities.

Issues Raised in Submissions
None of the submissions received from the public raised concerns regarding the proposal.

The DECC submission identified that if any new Aboriginal sites are identified during the project, they must be registered with DECC in accordance with s91 of the *National Parks and Wildlife Act 1974.* Impact to these sites should be avoided. If this is not possible, mitigation for impact must occur in accordance with s87 and s90 of the *National Parks and Wildlife Act 1974*.

Consideration of Issues
The Proponent, in the Submissions Report, confirmed that in accordance with the requirements in the DECC submission regarding Aboriginal heritage, any Aboriginal sites which are discovered throughout the project development would be registered with DECC in accordance with Section 91 of the *National Parks and Wildlife Act 1974* and impacts to these sites would be avoided. The Proponent has also committed, in the revised Statement of Commitments, to cease all works in the vicinity of the area should any unknown Aboriginal objects or items be located, until specialist Aboriginal heritage advice is received.

The Department is satisfied that the Proponent's mitigation measures are adequate to protect Aboriginal heritage items and has incorporated a number of requirements to manage and protect Aboriginal objects and sites as part of the proposed Heritage Management Plan.

5.7.5 Waste minimisation and management

Issues Raised in Environmental Assessment
Construction and maintenance of new and existing road infrastructure involve a range of activities including establishment of worksites, operation of site amenities, demolition and reconstruction of road surfaces and medians, bridge works, and decommissioning of work sites, which can produce a number of waste types.

Waste generated during operation is likely to be minimal and would be typical of that produced during routine maintenance activities.

Issues Raised in Submissions
None of the submissions received from the public raised concerns regarding the proposal.

The DECC submission identified that any waste material, whether it be imported to or generated on the site, must be managed in accordance with the DECC Guidelines: *Waste Classification Guidelines Part 1: Classifying Waste (April 2008).*

The DPI submission required that rehabilitation measures include the removal of temporary jetty posts following construction.

Consideration of Issues
The Proponent, in the Submissions Report, confirmed that all elements of temporary jetties including the posts would be removed, as required by DPI. The Proponent has also committed, in the revised Statement of Commitments, to minimising waste production and incorporating the 'waste hierarchy' into work programs, purchase strategies, and site inductions.

The Department is satisfied that the Proponent's mitigation measures are adequate to manage waste produced by the project. Additionally, the Department has recommended that waste be managed in accordance with the *Waste Classification Guidelines* (DECC, 2008).

5.7.6 Climate change and greenhouse emissions

Issues Raised in Environmental Assessment
The project is unlikely to be severely affected by the effects of climate change. The bridge has been designed with regard to temperature, water level and wind durability.

A greenhouse gas (GHG) emission assessment has been carried out to determine potential impacts of the project on climate change, for both construction and operational emissions. Potential impacts include direct GHG emissions, indirect GHG emissions associated with the production of electricity, steam or heat, and other upstream and downstream GHG emissions.

Issues Raised in Submissions
A small number of submissions from the public raised concerns regarding greenhouse criteria. The key concerns raised in public submissions were that the project fails Greenhouse criteria.

The generic form letters submitted for the proposal included the following key concerns:
- global warming and reduction of Carbon emissions is an imperative, the construction of new road space and the destruction of parkland must stop; and
- it is inconsistent with Australia's international legal obligations under the Kyoto Protocol and stated goals in relation to the reduction of carbon omissions and global warming.

Consideration of Issues
The Department notes that the Proponent has committed to minimising energy consumption and greenhouse gas emissions during construction. Energy efficient equipment and management measures will be used where feasible and reasonable to reduce greenhouse gas emissions.

The project is aimed at improving bus services on Victoria Road and the provision of a more efficient travelling lane for buses within the project area has the potential to reduce the amount of carbon emissions emitted during operation. By providing greater facilities and more efficient travel for buses along this route, there is the potential that the project would result in a modal shift by passengers from cars to buses thereby further reducing carbon emissions.

5.7.7 Hazards and risks

Issues Raised in Environmental Assessment
In the absence of environmental and safety controls, a number of hazards and risks have the potential to pose a danger to site personnel, members of the public and the environment, including:

<u>Construction risks</u>
- release of dangerous and hazardous materials to the receiving environment;
- increased sedimentation of receiving waters; and
- disturbance of contaminated soils and sediments, or acid sulfate soils.

<u>Operational risks</u>
- operational hazards and risks common to urban roads.

Issues Raised in Submissions
No submissions raised concerns regarding the proposal.

Consideration of Issues
These issues have been considered in previous sections, including Transport, Contamination and Geology and Soils, and Water.

5.7.8 Cumulative Impacts

Issues Raised in Environmental Assessment

Spatially, the consideration of cumulative impacts has generally been confined to the Drummoyne peninsula and the Balmain peninsula (including Rozelle). Temporally, the focus has been on interactions with those developments likely to occur at or around the same time as the Victoria Road upgrade.

The proposed CBD Metro, between Central Station and Rozelle, is a major transport initiative that has potential to interact with the project.

Potential cumulative impacts include:

- traffic effects, including access requirements;
- future integration with the CBD Metro project;
- future integration with the M4 Extension; and
- amenity effects, due to concurrent construction works.

Issues Raised in Submissions

No submissions raised concerns regarding the proposal.

Consideration of Issues

These issues have been generally considered in previous sections, including traffic congestion and management, and transport integration in the Transport section, and construction and operation amenity impacts in the Urban Design section.

6. CONCLUSIONS AND RECOMMENDATIONS

Following a detailed assessment of the Environmental Assessment, Submissions Report and the submissions received during the exhibition period for the project, the Department is satisfied that the impacts of the project can be appropriately mitigated or managed to acceptable levels and therefore recommends that the project be approved subject to the recommended conditions of approval. However, this does not imply that there are not environmental constraints to the project. Of particular note are the traffic and transport impacts during construction, social and economic impacts including loss of car parking, construction noise impacts, and the visual amenity and urban design aspects of the project.

The Department recognises the importance of Iron Cove to recreational water users and has recommended conditions of approval that require the Proponent to ensure the safety of water users in consultation with NSW Maritime and that require the Proponent to minimise changes to horizontal clearances of the new bridge and to ensure that the operation of a rowing course beneath it, complies with the relevant standards.

The Department notes the constrained traffic environment adjoining the project and accordingly has recommended a range of conditions that will manage and minimise construction traffic impacts. These include ensuring that parking and queuing of construction vehicles on public roads is minimised, and that a parking strategy is developed in consultation with councils, with the aim of minimising the impact of parking losses to businesses, recreational users and the wider community.

The Department notes the need to undertake a range of out of hours activities to minimise transport impacts along Victoria Road. Reasonable and feasible mitigation measures appropriate for each activity and location where impacts might arise would need to be implemented. Consequently, the Department has recommended that 24 hour construction be permitted subject to strict criteria and the preparation of a construction noise and vibration management plan to mitigate and monitor noise and vibration impacts. The ongoing acoustic performance of the project will also be addressed through an operational performance audit, and acoustic treatments for individual properties installed where required.

The project will temporarily impact on local open space areas, particularly King George Park during construction where a significant construction compound will be located. The proposed Urban Design and Landscape Plan requires the restoration of public space impacts. The Department has also recommended conditions of approval that require maintenance of safe pedestrian and cyclist access during construction, measures for establishment and management of construction site compounds to ensure minimal impact to the surrounding uses, and consultation with Leichhardt Municipal Council regarding the use of King George Park during construction.

Whilst the Department acknowledges that the new bridge will introduce a significant visual element into the existing environment, it also considers that this impact is highly subjective and that the Proponent has attempted, through consultation and design, to minimise the visual presence of the bridge. The Department considers that the finalisation of the urban and landscape design in consultation with councils will also ensure that local considerations and council strategies are suitably integrated into the final urban design solutions and reflect local values.

The recommended conditions of approval for the project also provide for the mitigation and management of other impacts associated with the project during the detailed design, construction and operational phases of the project, such as soil contamination issues, indigenous and non-indigenous heritage and impacts to air quality and water quality. The Department believes that these requirements will provide for the implementation of best management practices during all phases of the project, and ensure that the construction and operational impacts of the project on the surrounding environment and the amenity of local residents are managed to acceptable levels.

The Department acknowledges that there will be some residual impacts on the environment and local community regardless of the implementation of the recommended conditions of approval, particularly with respect to the impacts on the visual and park amenity once the project is operational and potential permanent losses to car parking. However, the Department has concluded that these residual impacts are considered to be acceptable given the benefits that the total project would provide to the general public through improved bus network capacity and performance.

Consequently, the Department recommends that the Minister for Planning approve the Victoria Road Upgrade, subject to the recommended conditions of approval.

APPENDIX A – RECOMMENDED CONDITIONS OF APPROVAL

APPENDIX B – STATEMENT OF COMMITMENTS

APPENDIX C – SUBMISSIONS REPORT

APPENDIX D – ENVIRONMENTAL ASSESSMENT